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Lumber Yields by the NEW TIMBER CRUISING LOG GRADES

for Old-growth Coast Douglas-fir

by
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Acknowledgments

LUMBER YIELDS BY THE NEW TIMBER CRUISING
LOG GRADES FOR OLD-GROWTH COAST DOUGLAS-FIR

Reference Abstract

Plank, Marlin E., and John W. Henley
  1976. Lumber yields by the new timber cruising log grades for old-growth Coast
      Douglas-fir. USDA For. Serv. Res. Pap. PNW-203, 30 p. Pacific North-
      west Forest and Range Experiment Station, Portland, Oregon.

  Lumber grade yields and recovery ratios obtained for old-growth Coast Douglas-fir
logs are presented for the new timber cruising log grades. Lumber yield information
is based on nearly 5,000 logs processed through 10 sawmills in Washington, Oregon,
and California. Curve relationships are shown for lumber grade recovery over diameter,
scale recovery ratio over diameter, lumber recovery factor over diameter, and net
Scribner and gross cubic scale defect over diameter for the four log grades. Tables
provide information on lumber yield distribution by diameter class and lumber grade in
addition to the foregoing.

KEYWORDS: Lumber recovery studies, old-growth Douglas-fir.

RESEARCH SUMMARY
Research Paper PNW-203
1976

This report presents lumber yield information based on a new system of grading old-growth Coast Douglas-fir by four grades. Nearly 5,000 logs were sawn in 10 sawmills throughout Washington, Oregon, and California. Lumber from each was identified and the identity maintained through the shipping tally.

The logs produced 2,699,546 board feet of lumber. About 54 percent of the lumber production was in 2-inch Dimension; 1-inch Board, Shop, and other items thicker than 2 inches accounted for 10, 12, and 24 percent of the total, respectively. Lumber grade yield patterns shown in curve and table form emphasize the need for stratification by log grade and diameter.

Defect deductions averaged 10, 12, and 12 percent, respectively, for grades 1, 2, and 3 logs but increased to 19 percent for grade 4 logs. Curves of defect over diameter are shown for each log grade.

On the average, about 64 percent of the gross cubic content of the log was manufactured into rough green lumber although this depended on the log mix. About 25 percent of this lumber volume was lost as shrinkage and planer shavings. Thus, about 50 percent of the cubic content of the log was finally shipped as lumber. These relationships are shown in tables and curve form. Other tables and curves show lumber grade yield patterns by diameter for the four log grades.

Introduction

New timber cruising grades have been developed for old-growth Coast Douglas-fir (4,5). These grades were developed for logs in standing trees. Lumber recovery information obtained for these grades are presented in this report. The information is considered to be representative of Coast Douglas-fir and useful to forest managers, buyers, and timber processors in appraising, harvesting, and processing such timber. The new log grading system for Douglas-fir, on which these recovery data are based, was developed from studies of timber characteristics and their relationships to end-product yield and values.

This report is one of several based on an analysis of timber characteristics and lumber and veneer yields from more than 1,000 trees throughout the Douglas-fir region of Washington, Oregon, and California. Two reports present lumber and veneer yield according to current Forest Service sawmill log-peeler log grading criteria (3,6). Veneer recovery information, based on the new timber cruising grades, is presented in another report (8).

RECOVERY BASIS

The lumber yield data are based on 4,974 logs sawn at 10 sawmills in California, Oregon, and Washington. These logs came from trees selected from approximately 100 sample areas. The study trees were selected to be representative of trees in each size and quality class of west-side commercial Douglas-fir timber. The total log sample was not intended to be representative of a typical log mix at a mill.

The recovery data are presented on the basis of the sawn log. This approxi-

mates the Forest Service cruise log length where grades are applied in 16-foot lengths through the first three 32-foot logs. The sawn logs had the following length distribution:

Log length (Feet)	Number	Percent[1]
8	11	0.2
10	46	.9
12	260	5.2
14	459	9.2
16	1,736	34.9
17	6	.1
18	719	14.5
20	1,111	22.3
22	144	2.9
24	308	6.2
26	87	1.7
28	15	.3
30	8	.2
32	12	.2
34	36	.7
35	0	0
36	14	.3
38	0	0
40	2	--

Average log length was almost 18 feet.

Logs were bucked for sawing according to practices normally followed at each study mill. The logs were scaled after they were bucked for sawing, normally as they entered the sawmill, by Bureau of Land Management rules.[2] These scaling rules follow National Forest Log Scaling Handbook rules, except for scale deduction procedures. Volumes are in Scribner Decimal C scale.

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[1] Does not add to 100 due to rounding.

[2] Bureau of Land Management, Log Scaling Manual Supplements, on file at the Oregon State Office, Portland.

A detailed diagram of size, position, and type of all surface characteristics was prepared for each study log (2). Existing and trial grading specifications were applied to the diagrams to determine the grade of each log. Upon completion of the development and testing of the grading system, the study logs were graded by application of the final specifications (appendix) to these diagrams.

SAWING, SURFACING, AND TALLYING

Equipment, manufacturing methods, and product outturn of the study sawmills were representative of general industry practices in the Coast Douglas-fir region. Mill production equipment included band headsaws, edgers, band resaws, and gang trimmers. The mills cut the logs by their normal manufacturing procedures for producing optimum values of Board, Dimension, Select, and Shop lumber items. The logs were sawn during the period 1964-67.

When study trees were felled and bucked into logs, each log was numbered to identify its origin as to sample area, tree number, and position in the tree. This identity was maintained on each piece of lumber through the manufacturing process to the final point of grading and tally. The lumber was graded by, or under the direct supervision of, a quality supervisor of Western Wood Products Association, West Coast Lumber Inspection Bureau, or Pacific Lumber Inspection Bureau. All study lumber was graded under the West Coast Lumber Inspection Bureau's standard grading and dressing rules (7).

Each piece was tallied by shipping dimension, grade, and log number. In some mills, this tally was made after surfacing; in others, on the green chain. For the latter, the grader "pencil trimmed" where necessary, and the anticipated surfaced tally was recorded. All 2-inch Dimension, Board, and timber items were tallied in a green condition. The condition of the Select and Shop items varied, as noted in table 1. A general summary of the production characteristics of the 10 sawmills is shown in table 1.

Table 1—Manufacturing characteristics of the study sawmills

Study location	Production equipment 1/	Approximate production per 8-hour shift	Lumber items produced				
			Select	Shop	Boards	2-inch Dimension	Timbers
		Thousand board feet					
Washington:							
Northern Washington Cascades	BHS, E, VRS, TS	90	Green	Green	Green	Green	Green
Southern Washington Cascades	BHS, E, GS, TS	100	Green	--	Green	Green	Green
Olympic Peninsula	BHS, E, GS, TS, VRS	160	Green	Green	Green	Green	Green
Oregon:							
Northern Oregon Cascades	BHS, E, HRS, TS	100	Green	--	Green	Green	Green
Central Oregon Cascades	BHS, E, VRS, TS	110	Green	Green	Green	Green	Green
Southern Oregon Cascades	BHS, E, VRS, TS	90	Dry	Dry	Green	Green	--
Oregon coast	BHS, E, VRS, TS	85	Green	Green	Green	Green	Green
California:							
Northern California coast	BHS, E, VRS, GS, TS	100	Green	--	Green	Green	Green
Northern Sierras	BHS, E, GS, TS	75	Dry	Dry	Green	Green	--
Central Sierras	BHS, E, VRS, TS	150	Dry	Dry	Green	Green	--

1/ BHS - band headsaw, E - edger, VRS - vertical band resaw, HRS - horizontal band resaw, TS - trim saws, GS - gang saw.

COMPILATION OF DATA

The tally information obtained for the sawn logs was computed to obtain lumber grade yields in board feet (1). The cubic-foot volume of the logs, lumber, sawdust, and residue was also calculated for each log. The gross cubic log volume was computed by the formula:

Gross cubic log volume =

$$0.001818 \ L(D_S^2 + D_S D_L + D_L^2)$$

where: D_S is the log scaling diameter in inches, small end;

D_L is the log scaling diameter in inches, large end; and

L is the log scaling length in feet.

The lumber cubic-foot volumes are based on average rough green dimensions. These average dimensions were obtained from measurements of a selected sample of the lumber during each mill study. The sawdust volumes in cubic feet were calculated from an assumed average saw kerf thickness for each mill and the computed rough green surface area of the lumber from each log. The residue volume in cubic feet is the gross cubic log volume minus lumber and sawdust volumes. Thus, the residue volume includes a small amount of sawdust from the production of slabs, edgings, and trim ends. Note that gross cubic volume is based on scale lengths; an average trim allowance of 6 inches would increase the gross cubic volume of the average log by 2.8 percent, with a corresponding increase in volume of residue.

Results

Total log scale, lumber tally, and cubic-foot volume are summarized by log grade in table 2. These values, as well as the lumber grade yields, are presented by scaling diameter and log grade in the appendix. These tables permit further analysis by those who may be interested and are the basis for subsequent discussion. The recovery ratios are based on totals by log grade from results obtained in 10 sawmills.

LUMBER RECOVERY

The 4,974 logs produced 2,699,546 board feet of lumber. This lumber volume is summarized by thickness, width, and grade in table 3. About 54 percent of the lumber production was in 2-inch Dimension; 1-inch Board, Shop, and other items thicker than 2 inches accounted for 10, 12, and 24 percent of the total, respectively.

Table 2—Total log scale, lumber tally, and cubic volume by log grade

Log grade	Number of logs	Log scale[1]		Lumber tally		Cubic volume				
		Gross	Net	Volume	Recovery ratio[2]	Log	Lumber	Lumber recovery ratio[3]	Sawdust	Residue
		- - - - *Board feet* - - - -			- *Percent* -	- - - *Cubic feet* - - -		- *Percent* -	- - - *Cubic feet* - - -	
No. 1	559	526,740	473,640	516,833	109	70,553.17	44,693.02	63	7,445.70	18,414.45
No. 2	1,047	720,460	636,660	712,985	112	97,726.37	61,512.33	63	10,710.76	25,503.28
No. 3	2,210	863,610	760,950	924,627	122	119,961.41	78,500.79	65	13,836.61	27,624.01
No. 4	1,158	535,350	432,340	545,101	126	74,397.17	46,157.12	62	8,155.07	20,084.98
Total or average	4,974	2,646,160	2,303,590	2,699,546	117	362,638.12	230,863.26	64	40,148.14	91,626.72

[1] As scaled by Bureau of Land Management scales, east side log scaling rules, Scribner Decimal C log scale.

[2] Lumber tally volume as percentage of net log scale volume.

[3] Lumber cubic volume as percentage of log cubic volume.

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Table 3—Distribution of lumber volume by thickness, width, and grade from 4,974 sawn-length logs

Thickness	Width	Volume	Grade													
			8 & Btr. Select	C Select	O Select	Moulding	Factory Select	No. 1 Shop	No. 2 Shop	No. 3 Shop	Select Structural[1]	Construction	Standard	Utility	Economy	All grades
- - - - - Inches - - - - -		Board feet	- Percent of total lumber volume -													
1	2,3,4	48,446	0.17	0.53	0.23	--	--	--	--	--	0.01	0.33	0.20	0.20	0.12	1.79
	6	67,424	.18	.58	.35	--	--	--	--	--	.04	.53	.40	.29	.13	2.50
	8	74,384	.11	.47	.34	--	--	--	--	--	.03	.42	.41	.64	.34	2.76
	10	23,333	.12	.33	.26	--	--	--	--	--	(2/)	.05	.04	.04	.02	.86
	12 & wider	58,790	.53	.74	.67	--	--	--	--	--	(2/)	.09	.05	.08	.02	2.18
Total		272,377	1.11	2.65	1.85	--	--	--	--	--	.08	1.42	1.10	1.25	.63	10.09
2	2,3,4	207,183	.49	.86	.46	--	--	--	--	--	.46	1.70	1.16	1.62	.92	7.67
	6	251,822	.85	1.12	.39	--	--	--	--	--	.76	1.98	1.50	1.94	.79	9.33
	8	253,864	.36	.51	.26	--	--	--	--	--	1.13	2.40	1.90	2.16	.68	9.40
	10	150,815	.24	.40	.18	--	--	--	--	--	1.32	1.63	1.04	.62	.16	5.59
	12 & wider	579,212	.91	.73	.29	--	--	--	--	--	3.42	6.97	4.50	3.65	.98	21.45
Total		1,442,896	2.85	3.62	1.58	--	--	--	--	--	7.09	14.68	10.10	9.99	3.53	53.44
3 & 4	4	47,917	.06	.15	.02	--	--	--	--	--	.38	.54	.20	.27	.16	1.78
	6	150,270	.84	.56	.08	--	--	--	--	--	1.12	1.33	.75	.43	.46	5.57
	8	72,330	.37	.25	.03	--	--	--	--	--	.45	.78	.37	.34	.09	2.68
	10	76,840	.46	.17	.02	--	--	--	--	--	.90	.70	.53	.06	.01	2.85
	12 & wider	175,167	1.80	.34	.05	--	--	--	--	--	.82	1.48	.88	.97	.15	6.49
Total		522,524	3.53	1.47	.20	--	--	--	--	--	3.67	4.83	2.73	2.07	.87	19.37
5 & thicker	6	43,584	.11	.07	(2/)	--	--	--	--	--	.46	.66	.27	.03	.01	1.61
	8	24,642	.05	.07	(2/)	--	--	--	--	--	.37	.25	.03	.14	0	.91
	10	11,290	.10	.01	0	--	--	--	--	--	.07	.21	.03	0	0	.42
	12 & wider	50,634	.18	.02	0	--	--	--	--	--	.47	.56	.19	.45	(2/)	1.87
Total		130,150	.44	.17	0	--	--	--	--	--	1.37	1.68	.52	.62	.01	4.81
1 (4/4)	Random	46,710	--	--	--	0.93	0.25	0.30	0.25	(2/)	--	--	--	--	--	1.73
1-1/4 (5/4)	Random	128,574	--	--	--	1.43	.13	.85	1.88	0.47	--	--	--	--	--	4.76
1-1/2 (6/4)	Random	46,420	--	--	--	.44	.15	.44	.58	.11	--	--	--	--	--	1.72
1-5/8	Random	47,659	--	--	--	0	.32	.51	.71	.23	--	--	--	--	--	1.77
2	Random	62,236	--	--	--	.07	.87	.59	.66	.12	--	--	--	--	--	2.31
Total		331,599	--	--	--	2.87	1.72	2.69	4.08	.93	--	--	--	--	--	12.29
Total all items		2,699,546	7.93	7.91	3.63	2.87	1.72	2.69	4.08	.93	12.21	22.61	14.45	13.93	5.04	100.00

[1] 1-inch boards are termed Select Merchantable.

[2] Percentage is less than 0.005.

The influence of log quality and size on lumber yield is shown in figure 1. The variability that occurs in lumber yield has been smoothed by curving to indicate yield patterns. There was a significant increase in the proportion of Select grade lumber as log size increased. A reverse pattern is evident for Standard and Better lumber. The need for stratification by log grade and diameter is emphasized by the yield patterns.

DEFECT

The average defect deduction for the 10 studies was 13 percent. As expected, the smaller logs contained the least defect and the deduction increased with an increase in diameter. Defect deductions for grades 1, 2, and 3 logs averaged 10, 12, and 12 percent, respectively, but increased to 19 percent for grade 4 logs. Defect in grades 3 and 4 logs increased with increased diameter. This is to be expected because logs with scars containing evidence of rot were kept out of the higher grades. The relationship between defect percent and diameter for each log grade and all grades combined is shown in figure 2. There was a significant difference (5-percent level) among the relationships of defect percent over diameter for the various log grades.

LUMBER RECOVERY RATIOS (OVERRUN)

The ratios of lumber tally to net scale, commonly referred to as overrun, are related to log size and defect. The curves shown in figure 3 result from fitting quadratic or 2d-degree equations to the
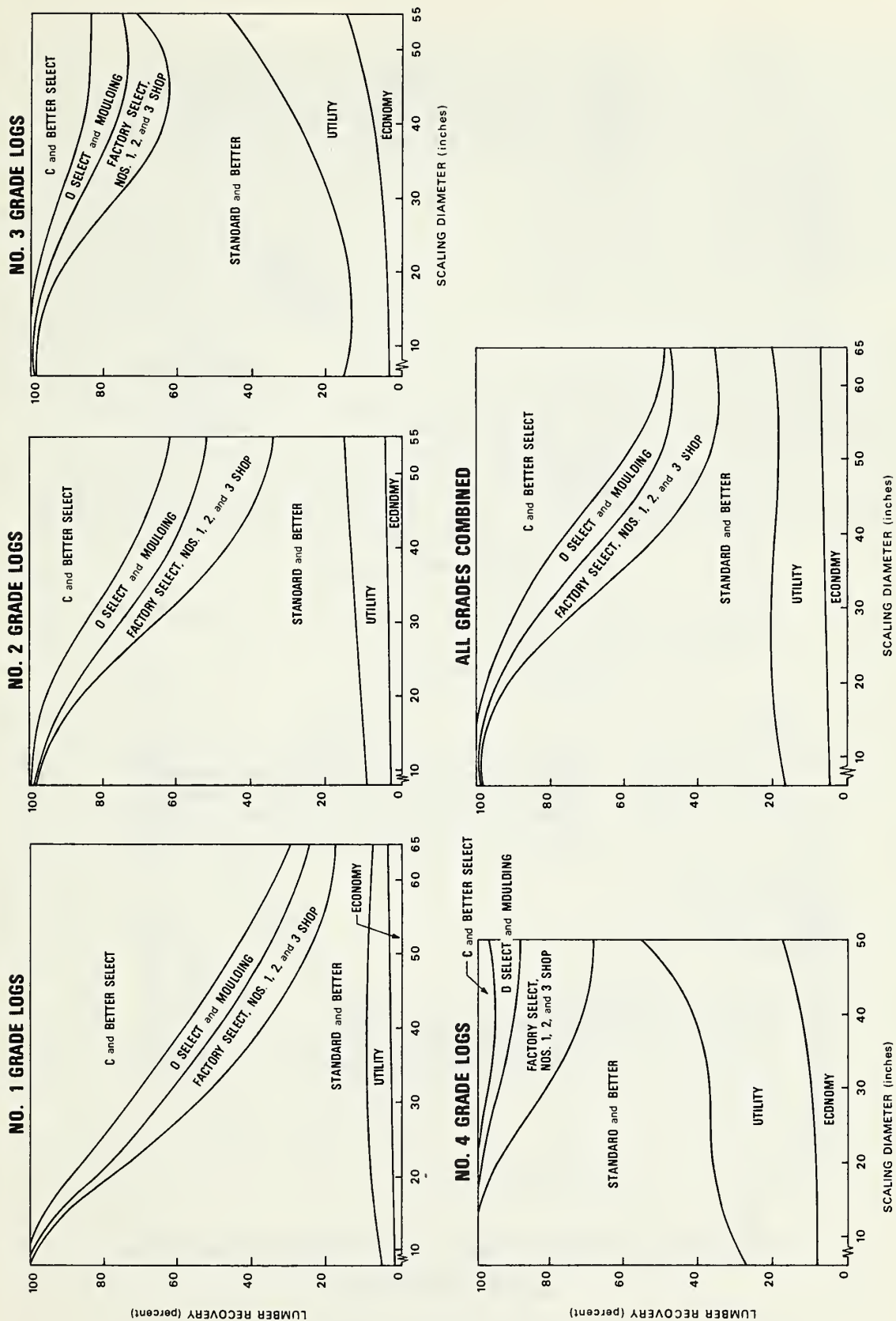
Figure 1.--Lumber recovery by scaling diameter and log grade.

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GRADE 1   Y = 2.319 + 0.453 (diameter) − 0.00331 (diameter ^{2})
GRADE 2   Y = 0.473 + 0.268 (diameter) + 0.00173 (diameter ^{2})
GRADE 3   Y = 4.637 − 0.167 (diameter) + 0.0131 (diameter ^{2})
GRADE 4   Y = 17.826 − 0.417 (diameter) + 0.0146 (diameter ^{2})
ALL GRADES Y = 3.20 + 0.301 (diameter) + 0.000011 (diameter ^{2})
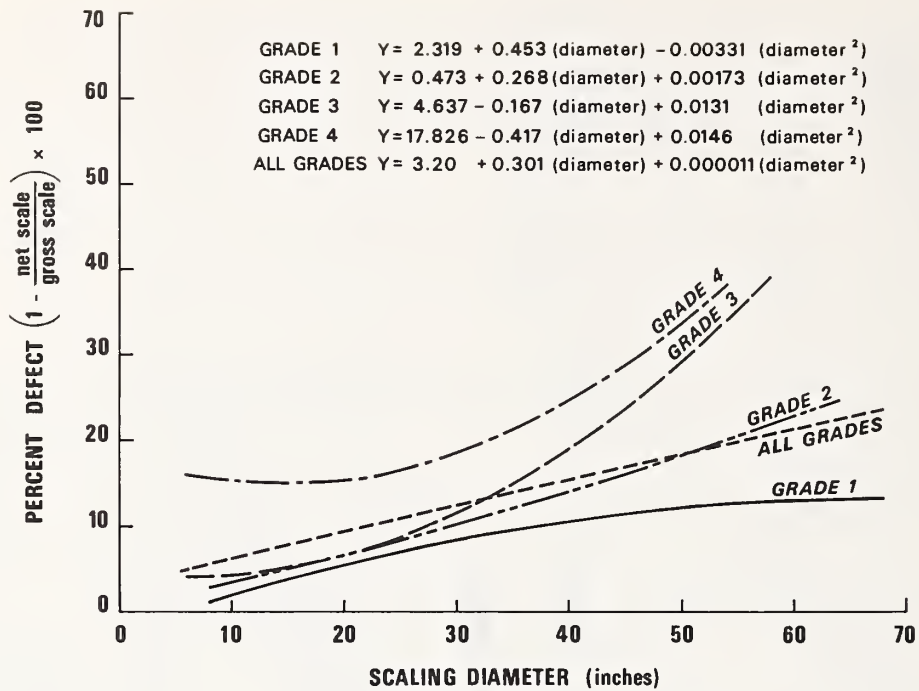
Figure 2.--Relationship of log scale defect to scaling
    scaling diameter.

GRADE 1   Y = 140.43 − 1.481 (diameter) + 0.0164 (diameter ^{2})
GRADE 2   Y = 157.66 − 2.621 (diameter) + 0.035 (diameter ^{2})
GRADE 3   Y = 179.90 − 4.08 (diameter) + 0.064 (diameter ^{2})
GRADE 4   Y = 222.08 − 6.25 (diameter) + 0.093 (diameter ^{2})
ALL GRADES Y = 177.72 − 3.489 (diameter) + 0.0453 (diameter ^{2})
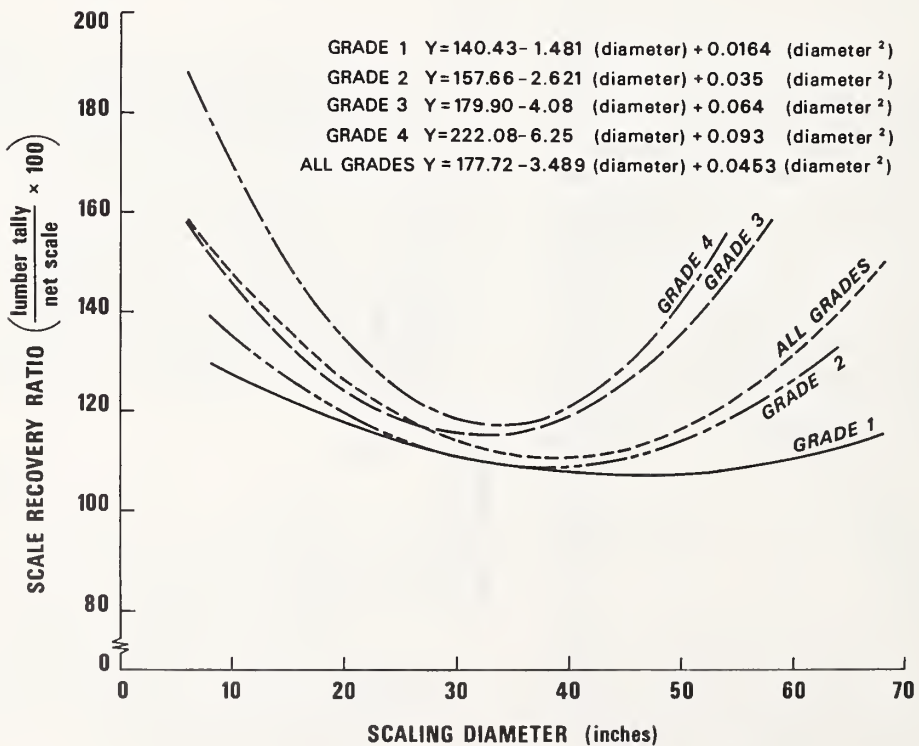
Figure 3.--Relationship of board-foot lumber tally-net scale
    recovery ratio to scaling diameter of logs.

ratios. These ratios tend to decrease as log diameter approaches 30-40 inches, where they begin to swing upward. This upward trend apparently occurs because lumber is recovered from portions of the log which contain defect and for which a scale deduction has been made. The board-foot lumber tally-net scale ratios show a significant difference (5-percent level) among the relationships of the ratios over diameter for the various log grades.

CUBIC RATIOS

The relationship of the lumber cubic volume recovery ratio to scaling diameter is shown in figure 4. This relationship has an opposite trend to that of the board-foot lumber tally ratio. The cubic ratio tends to increase to about 35 inches and then trends downward. On the average, about 64 percent of the gross cubic content of the log was manufactured into rough green lumber. About 25 percent of this lumber volume was lost as shrinkage and planer shavings. Because of this, about 50 percent of the cubic log content was shipped as lumber.

The relationship of board-foot lumber yield per gross cubic foot of log input to scaling diameter is snown in figure 5. The cubic-volume curves show a significant difference among the relationships of lumber recovery over diameter for the various grades at the 5-percent level.

GRADE 1 $Y = 51.81 + 0.714 \text{ (diameter)} - 0.010 \text{ (diameter}^2)$
GRADE 2 $Y = 49.66 + 0.928 \text{ (diameter)} - 0.0147 \text{ (diameter}^2)$
GRADE 3 $Y = 33.73 + 2.465 \text{ (diameter)} - 0.0421 \text{ (diameter}^2)$
GRADE 4 $Y = 33.78 + 2.086 \text{ (diameter)} - 0.0349 \text{ (diameter}^2)$
ALL GRADES $Y = 40.22 + 1.668 \text{ (diameter)} - 0.0262 \text{ (diameter}^2)$
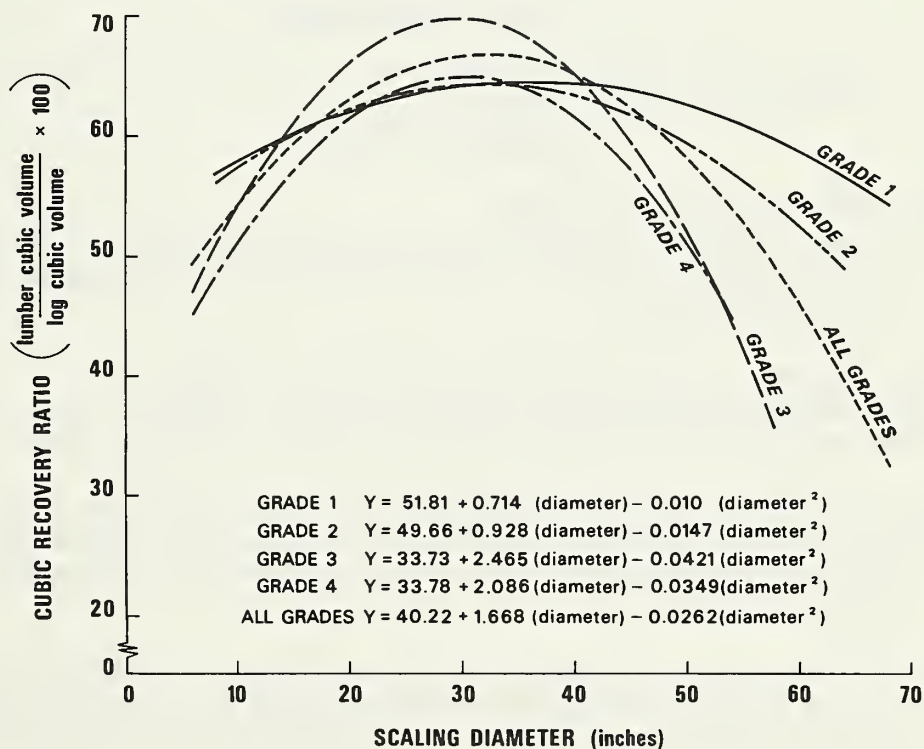
Figure 4.--Relationship of lumber cubic volume recovery ratio to scaling diameter of logs.

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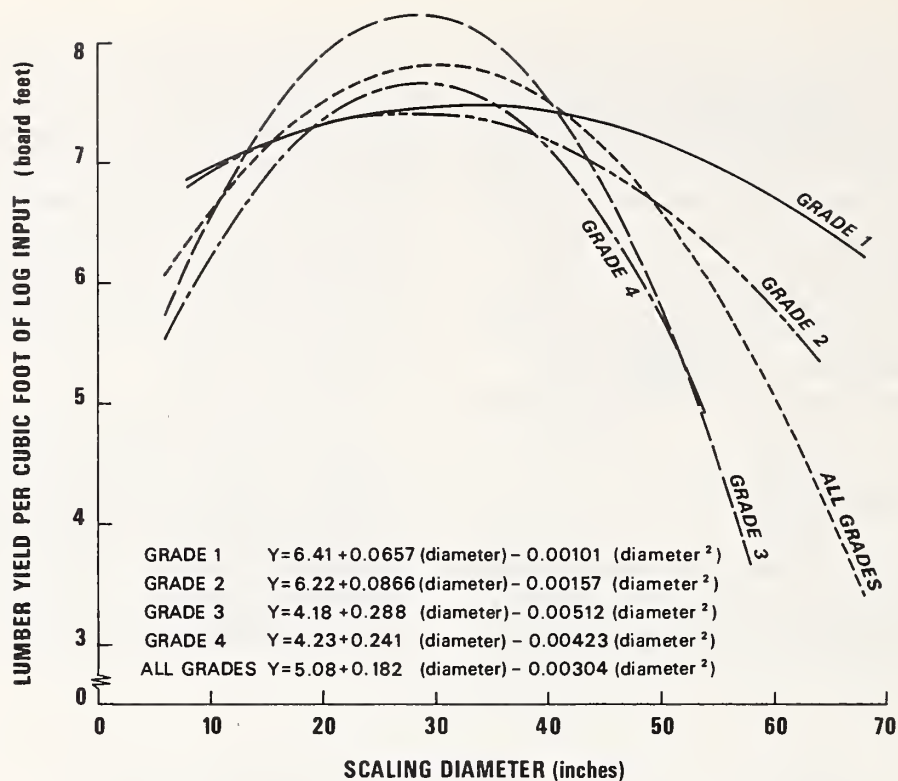
Figure 5.--*Relationship of board-foot yield per cubic foot of log input to scaling diameter.*

The figure contains the following equations:

GRADE 1 $Y = 6.41 + 0.0657 \text{ (diameter)} - 0.00101 \text{ (diameter}^2)$
GRADE 2 $Y = 6.22 + 0.0866 \text{ (diameter)} - 0.00157 \text{ (diameter}^2)$
GRADE 3 $Y = 4.18 + 0.288 \text{ (diameter)} - 0.00512 \text{ (diameter}^2)$
GRADE 4 $Y = 4.23 + 0.241 \text{ (diameter)} - 0.00423 \text{ (diameter}^2)$
ALL GRADES $Y = 5.08 + 0.182 \text{ (diameter)} - 0.00304 \text{ (diameter}^2)$

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METRIC EQUIVALENTS

Lumber size (Inches)	Metric equivalent[1] (Millimeters)
1	25.4 (25)
5/4	31.7 (32)
6/4	38.1 (38)
1-5/8	41.3 (41)
2	50.8 (50)
3	76.2 (75)
4	101.6 (100)
5	127.0 (125)
6	152.4 (150)
8	203.2 (200)
10	254.0 (250)
12	304.8 (300)

U.S. lengths (Feet)	Metric equivalent[1] (Meters)	U.S. lengths (Feet)	Metric equivalent[1] (Meters)
8	2.44 (2.4)	26	7.92 (7.8)
10	3.05 (3.0)	28	8.53 (8.4)
12	3.66 (3.6)	30	9.14 (9.0)
14	4.27 (4.2)	32	9.75 (9.6)
16	4.88 (4.8)	34	10.36 (10.2)
18	5.49 (5.4)	36	10.97 (10.8)
20	6.10 (6.0)	38	11.58 (11.4)
22	6.71 (6.6)	40	12.19 (12.0)
24	7.32 (7.2)		

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[1] Figures in parentheses represent nominal sizes used in European trading.

Appendix

Table 4—*Log scale, lumber tally, and cubic volumes by scaling diameter, log grade No. 1*

Log scaling diameter (inches)	Number of logs	Log scale[1]		Lumber tally		Cubic volume				
		Gross	Net	Volume	Recovery ratio[2]	Log	Lumber	Lumber recovery ratio[3]	Sawdust	Residue
		- - - - Board feet - - - -			Percent	- - - Cubic feet - - - -		Percent	- - - Cubic feet - - -	
8	1	30	30	29	97	7.10	2.29	32	0.41	4.40
9	1	30	30	35	117	6.19	2.98	48	.54	2.67
10	5	320	310	401	129	54.95	33.64	61	5.98	15.33
11	7	530	520	709	136	101.00	59.08	58	10.60	31.32
12	5	400	400	599	150	74.23	50.40	68	9.10	14.73
13	9	1,000	1,000	1,236	124	182.30	104.33	57	15.22	62.75
14	8	970	950	1,161	122	181.22	98.33	54	15.53	67.36
15	12	2,120	2,090	2,431	116	334.36	204.84	61	32.55	96.97
16	9	1,720	1,640	2,096	128	265.76	176.77	67	26.26	62.73
17	12	2,540	2,320	2,873	124	423.93	242.48	57	36.99	144.46
18	9	1,950	1,920	2,256	117	303.70	190.97	63	30.45	82.28
19	10	2,550	2,350	2,758	117	388.84	230.18	59	38.35	120.31
20	12	3,690	3,230	3,774	117	550.47	323.33	59	52.55	174.59
21	17	6,340	6,100	6,814	112	859.94	582.98	68	88.10	188.86
22	9	3,690	3,690	4,126	112	519.49	353.10	68	55.20	111.19
23	17	7,090	6,520	7,250	111	1,012.04	611.78	60	99.97	300.29
24	10	4,580	4,130	4,748	115	653.48	405.43	62	66.61	181.44
25	13	6,840	6,230	7,182	115	949.38	608.09	64	99.12	242.17
26	19	10,170	9,580	10,323	108	1,407.68	883.38	63	140.13	384.17
27	14	8,290	7,420	7,769	105	1,039.70	669.27	64	113.71	256.72
28	14	9,780	9,460	10,273	109	1,299.09	877.91	68	132.58	288.60
29	18	11,330	10,190	12,127	119	1,566.34	1,044.83	67	188.82	332.69
30	19	14,410	13,290	14,072	106	1,880.11	1,211.58	64	185.35	483.18
31	11	9,510	8,920	9,754	109	1,294.90	836.61	65	124.90	333.39
32	20	15,070	14,260	15,098	106	2,009.02	1,299.56	65	215.10	494.36
33	18	15,980	14,550	16,420	113	2,265.50	1,407.46	62	248.37	609.67
34	13	10,800	10,060	10,608	105	1,492.57	922.99	62	153.05	416.53
35	21	20,050	18,050	20,550	114	2,761.08	1,782.84	65	305.54	672.70
36	19	19,670	17,390	18,579	107	2,564.67	1,614.96	63	279.91	669.80
37	19	21,660	19,710	20,957	106	2,863.20	1,814.89	63	324.41	723.90
38	20	24,440	21,450	24,261	113	3,403.96	2,086.61	61	359.69	957.66
39	16	18,960	16,570	19,033	115	2,530.94	1,652.24	65	286.71	591.99
40	17	21,450	18,250	20,225	111	2,703.70	1,785.16	66	323.52	595.02
41	17	21,750	18,860	19,870	105	2,864.08	1,728.81	60	290.86	844.41
42	11	15,520	13,440	14,850	110	1,959.80	1,289.80	66	214.40	455.60
43	15	24,470	22,500	23,875	106	3,139.15	2,071.96	66	335.27	731.92
44	12	18,670	17,270	18,609	108	2,405.62	1,638.42	68	273.46	493.74
45	9	14,730	13,150	14,589	111	1,981.24	1,265.61	64	233.24	482.39
46	8	12,110	11,510	11,646	101	1,535.21	1,025.29	67	180.58	329.34
47	10	17,410	15,700	17,208	110	2,300.69	1,494.47	65	250.68	555.54
48	13	25,520	22,930	23,774	104	3,404.35	2,083.55	61	357.35	963.45
49	7	14,720	13,600	14,897	110	1,984.74	1,286.80	65	199.30	498.64
50	3	5,150	4,940	4,667	94	640.15	411.99	64	75.29	152.87
51	4	8,760	8,090	9,254	114	1,182.77	794.22	67	118.08	270.47
52	7	14,150	11,190	12,254	110	1,837.80	1,069.80	58	191.97	576.03
53	2	4,200	2,690	3,550	132	629.94	311.89	50	59.95	258.10
54	5	11,190	10,250	10,520	103	1,471.77	913.41	62	143.35	415.01
55	4	12,430	11,350	11,650	103	1,628.03	1,003.09	62	137.65	487.29
56	1	2,500	1,840	1,836	100	328.63	153.17	47	24.75	150.71
57	2	4,570	4,020	4,445	111	593.07	381.29	64	53.37	158.41
58	--	--	--	--	--	--	--	--	--	--
59	2	5,880	5,210	5,526	106	748.52	483.56	65	87.54	177.42
60	--	--	--	--	--	--	--	--	--	--
61	--	--	--	--	--	--	--	--	--	--
62	1	3,620	2,940	3,486	119	432.99	291.87	67	38.41	102.71
63	--	--	--	--	--	--	--	--	--	--
64	1	3,870	3,270	3,602	110	475.31	301.06	63	43.05	131.20
65	1	3,190	2,800	2,672	95	434.62	228.55	53	31.33	174.74
66	--	--	--	--	--	--	--	--	--	--
67	--	--	--	--	--	--	--	--	--	--
68	1	4,370	3,480	3,526	101	623.85	293.12	47	40.50	290.23
Total or average	559	526,740	473,640	516,833	109	70,553.17	44,693.02	63	7,445.70	18,414.45

[1] As scaled by Bureau of Land Management scaler, east side log scaling rules, Scribner Decimal C log scale.

[2] Lumber tally volume as percentage of net scale volume.

[3] Lumber cubic volume as percentage of log cubic volume.

Log scaling diameter (inches)	Number of logs	Log scale[1]		Lumber tally		Cubic volume				
		Gross	Net	Volume	Recovery ratio[2]	Log	Lumber	Lumber recovery ratio[3]	Sawdust	Residue
		- - - - Board feet - - - -			Percent	- - - Cubic feet - - -		Percent	- - - Cubic feet - - -	
8	4	80	80	113	141	21.20	9.47	45	1.87	9.86
9	9	380	380	628	165	85.25	52.55	62	9.24	23.46
10	14	890	830	1,227	148	162.57	103.19	63	16.51	42.87
11	15	1,100	1,020	1,344	132	215.46	112.22	52	19.00	84.24
12	21	1,860	1,780	2,515	141	346.72	209.77	61	36.35	100.60
13	22	2,380	2,280	2,867	126	414.76	238.33	57	40.90	135.53
14	27	3,500	3,390	4,209	124	608.62	348.87	57	60.19	199.56
15	17	2,640	2,360	2,939	125	429.75	245.70	57	37.84	146.21
16	24	4,400	4,110	4,918	120	686.25	415.30	61	65.20	205.75
17	25	5,310	5,130	6,249	122	830.01	520.47	63	81.39	228.15
18	29	7,020	6,630	8,067	122	1,100.77	676.11	61	110.05	314.61
19	30	7,890	7,420	8,840	119	1,197.76	745.94	62	119.96	331.86
20	33	10,740	10,350	11,339	110	1,498.34	958.11	64	159.52	380.71
21	41	14,020	13,160	14,578	111	2,040.53	1,235.99	61	210.55	593.99
22	39	14,420	13,470	15,516	115	2,062.41	1,309.75	64	214.86	537.80
23	40	17,160	15,550	18,176	117	2,346.97	1,535.69	65	257.11	554.17
24	35	17,050	15,930	18,285	115	2,450.93	1,553.93	63	273.25	623.75
25	41	22,060	20,390	22,857	112	3,013.53	1,945.63	65	336.48	731.42
26	38	20,940	19,460	21,778	112	2,769.10	1,847.91	67	309.57	611.62
27	38	24,630	23,010	24,854	108	3,281.64	2,122.60	65	361.86	797.18
28	42	26,480	24,080	25,979	108	3,549.74	2,229.36	63	387.80	932.58
29	41	29,780	27,460	30,603	111	3,912.97	2,631.36	67	443.61	838.00
30	31	22,080	19,690	22,244	113	3,035.65	1,925.61	63	350.40	759.64
31	45	35,630	30,870	34,325	111	4,702.95	2,987.65	64	517.29	1,198.01
32	34	27,850	25,650	27,321	107	3,643.60	2,360.18	65	395.66	887.76
33	38	32,860	28,410	32,690	115	4,513.72	2,828.45	63	495.57	1,189.70
34	34	32,680	29,500	32,594	110	4,507.64	2,820.53	63	473.98	1,213.13
35	40	39,890	34,910	39,714	114	5,589.02	3,436.14	61	639.36	1,513.52
36	22	21,400	18,960	20,846	110	2,880.62	1,815.37	63	312.71	752.54
37	27	30,100	25,040	29,099	116	3,933.40	2,530.73	64	430.50	972.17
38	20	22,640	18,350	22,226	121	3,067.71	1,920.69	63	354.39	792.63
39	18	27,120	23,870	26,765	112	3,747.38	2,325.48	62	453.52	968.38
40	17	26,390	21,760	27,105	125	3,399.12	2,346.01	69	413.12	639.99
41	13	20,110	16,760	18,625	111	2,782.16	1,629.96	59	300.69	851.51
42	11	14,740	13,660	13,877	102	1,843.41	1,237.82	67	229.52	376.07
43	13	20,260	17,840	17,489	98	2,566.24	1,535.03	60	281.46	749.75
44	9	14,040	10,650	10,915	102	1,850.44	959.14	52	205.45	685.85
45	12	21,530	18,320	20,520	112	2,769.97	1,768.59	64	275.48	725.90
46	6	9,720	8,220	9,040	110	1,301.98	796.93	61	159.82	345.23
47	6	11,240	9,930	10,940	110	1,508.36	981.56	65	180.01	346.79
48	6	11,780	9,920	10,547	106	1,478.22	915.35	62	138.76	424.11
49	5	10,110	8,640	9,302	108	1,296.67	814.17	63	124.93	357.57
50	8	15,690	13,370	14,269	107	1,979.61	1,260.90	64	234.25	484.46
51	1	1,950	1,950	1,912	98	254.73	163.11	64	22.37	69.25
52	1	1,770	1,700	1,377	81	210.47	124.39	59	21.68	64.40
53	1	2,370	1,800	1,879	104	336.97	163.35	48	24.47	149.15
54	2	4,640	2,730	2,616	96	565.88	224.87	40	34.46	306.55
55	--	--	--	--	--	--	--	--	--	--
56	--	--	--	--	--	--	--	--	--	--
57	--	--	--	--	--	--	--	--	--	--
58	--	--	--	--	--	--	--	--	--	--
59	1	3,270	2,270	3,224	142	399.35	271.29	68	35.03	93.03
60	--	--	--	--	--	--	--	--	--	--
61	--	--	--	--	--	--	--	--	--	--
62	--	--	--	--	--	--	--	--	--	--
63	--	--	--	--	--	--	--	--	--	--
64	1	3,870	3,620	3,643	101	535.82	320.78	60	52.77	162.27
Total or average	1,047	720,460	636,660	712,985	112	97,726.37	61,512.33	63	10,710.76	25,503.28

[1] As scaled by Bureau of Land Management scaler, east side log scaling rules, Scribner Decimal C log scale.

[2] Lumber tally volume as percentage of net scale volume.

[3] Lumber cubic volume as percentage of log cubic volume.

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Table 6—*Log scale, lumber tally, and cubic volumes by scaling diameter, log grade No. 3*

Log scaling diameter (inches)	Number of logs	Log scale[1] Gross	Net	Lumber tally Volume	Recovery ratio[2]	Cubic volume Log	Lumber	Lumber recovery ratio[3]	Sawdust	Residue
		- - - - *Board feet* - - - -			*Percent*	- - - *Cubic feet* - - -		*Percent*	- - - *Cubic feet* - - -	
6	42	920	880	1,351	154	265.40	113.80	43	21.85	129.75
7	34	1,030	990	1,324	134	242.58	110.95	46	22.02	109.61
8	86	2,610	2,540	4,228	166	751.85	349.76	47	67.21	334.88
9	91	3,710	3,570	5,555	156	920.96	460.27	50	88.93	371.76
10	103	5,980	5,710	7,940	139	1,218.58	656.69	54	123.45	438.44
11	100	7,110	6,900	9,902	144	1,436.01	824.54	57	153.27	458.20
12	105	9,210	8,870	11,886	134	1,695.49	984.92	58	180.25	530.32
13	100	10,540	9,950	13,915	140	1,885.88	1,148.53	61	205.23	532.12
14	98	12,150	11,400	15,994	140	2,146.81	1,320.03	61	233.44	593.34
15	87	13,250	12,480	15,821	127	2,126.96	1,309.67	62	223.83	593.46
16	108	19,390	18,580	24,901	134	3,085.80	2,047.32	66	356.75	681.73
17	75	15,550	14,800	19,231	130	2,424.69	1,603.47	66	268.84	552.38
18	103	25,260	23,560	29,629	126	3,721.34	2,457.24	66	423.58	840.52
19	84	22,990	21,280	26,532	125	3,335.53	2,209.54	66	367.30	758.69
20	95	30,440	28,640	34,326	121	4,242.02	2,865.85	68	490.82	885.35
21	66	24,090	22,190	27,079	122	3,357.61	2,277.53	68	378.91	701.17
22	73	28,750	26,270	32,399	123	4,006.91	2,725.31	68	453.62	827.98
23	74	32,660	29,830	35,377	119	4,391.09	2,976.32	68	502.38	912.39
24	71	33,760	32,390	37,744	117	4,613.56	3,195.62	69	543.61	874.33
25	65	36,790	34,090	37,919	111	4,836.42	3,238.53	67	515.98	1,081.91
26	61	37,160	32,920	38,026	116	4,847.36	3,218.62	66	570.87	1,057.87
27	51	34,120	31,210	34,867	112	4,369.70	2,976.82	68	532.47	860.41
28	47	30,760	28,080	31,725	113	4,026.08	2,688.89	67	460.53	876.66
29	47	32,610	29,160	35,106	120	4,381.26	3,001.27	69	513.44	866.55
30	38	29,210	26,140	30,881	118	3,860.07	2,649.79	69	499.53	710.75
31	34	29,240	25,830	29,923	116	3,743.40	2,576.04	69	454.48	712.56
32	34	31,050	26,160	32,853	126	4,249.37	2,808.66	66	497.42	943.29
33	35	31,970	27,840	32,184	116	4,202.53	2,758.12	66	497.98	946.43
34	34	33,010	29,030	35,260	121	4,565.23	3,027.91	66	536.73	1,000.59
35	20	20,870	18,110	21,664	120	2,798.70	1,853.66	66	340.89	604.15
36	24	24,550	20,740	24,926	120	3,296.72	2,146.81	65	378.76	771.15
37	23	28,520	25,120	29,346	117	3,593.12	2,547.00	71	468.80	577.32
38	16	20,370	16,100	20,290	126	2,648.94	1,753.95	66	318.18	576.81
39	15	21,010	17,310	20,831	120	2,775.75	1,801.20	65	309.43	665.12
40	13	16,350	13,630	16,660	122	2,103.90	1,427.23	68	272.05	404.62
41	10	15,800	13,630	15,814	116	2,068.07	1,370.17	66	250.44	447.46
42	10	16,580	12,100	14,916	123	2,146.64	1,289.38	60	250.86	606.40
43	4	5,940	3,490	4,769	137	766.01	405.94	53	75.12	284.95
44	6	10,270	8,860	9,702	110	1,294.18	851.02	66	159.18	283.98
45	8	15,110	11,180	14,444	129	2,045.97	1,260.05	62	209.49	576.43
46	3	5,660	4,960	4,490	91	678.18	398.49	59	72.87	206.82
47	5	8,910	6,240	8,289	133	1,158.20	709.65	61	165.30	283.25
48	1	2,940	2,160	3,156	146	391.82	268.57	69	41.66	81.59
49	1	2,020	1,510	1,756	116	240.56	158.44	66	32.10	50.02
50	2	3,740	2,020	3,017	149	486.45	252.03	52	38.76	195.66
51	3	6,810	4,340	5,921	136	850.91	502.93	59	97.84	250.14
52	--	--	--	--	--	--	--	--	--	--
53	1	2,630	1,870	2,587	138	342.41	222.23	65	50.57	69.61
54	--	--	--	--	--	--	--	--	--	--
55	--	--	--	--	--	--	--	--	--	--
56	3	7,060	4,710	5,992	127	951.39	514.78	54	98.30	338.31
57	--	--	--	--	--	--	--	--	--	--
58	1	3,150	1,760	2,179	124	373.32	185.25	50	21.29	166.78
Total or average	2,210	863,610	760,950	924,627	122	119,961.41	78,500.79	65	13,836.61	27,624.01

[1] As scaled by Bureau of Land Management scaler, east side log scaling rules, Scribner Oecimal C log scale.

[2] Lumber tally volume as percentage of net scale volume.

[3] Lumber cubic volume as percentage of log cubic volume.

Table 7—Log scale, lumber tally, and cubic volumes by scaling diameter, log grade No. 4

Log scaling diameter (inches)	Number of logs	Log scale[1]		Lumber tally		Cubic volume				
		Gross	Net	Volume	Recovery ratio[2]	Log	Lumber	Lumber recovery ratio[3]	Sawdust	Residue
		- - - - Board feet - - - -			Percent	- - - Cubic feet - - -		Percent	- - - Cubic feet - - -	
6	6	180	120	254	212	60.02	21.45	36	4.13	34.44
7	1	30	20	82	410	11.24	6.99	62	1.30	2.95
8	14	450	430	861	200	134.81	71.81	53	12.19	50.81
9	22	1,350	1,240	1,901	153	326.67	158.32	48	28.64	139.71
10	22	1,250	1,150	1,694	147	309.70	138.22	45	28.28	143.20
11	30	2,450	2,000	3,205	160	537.14	264.83	49	51.42	220.89
12	37	3,080	2,580	4,348	168	683.60	360.74	53	65.41	257.45
13	40	4,720	4,180	6,184	148	914.27	513.99	56	90.39	309.89
14	49	6,210	5,120	8,458	165	1,181.57	693.85	59	128.58	359.14
15	51	7,920	6,780	9,688	143	1,355.47	799.08	59	143.51	412.88
16	53	9,730	8,270	12,372	150	1,670.70	1,019.17	61	184.89	466.64
17	49	10,480	8,610	12,296	143	1,760.41	1,034.28	59	174.60	551.53
18	53	12,690	10,730	14,467	135	2,002.03	1,197.74	68	197.31	606.98
19	52	14,570	11,930	16,309	137	2,269.80	1,345.17	59	226.49	698.14
20	66	21,220	17,010	22,910	135	3,086.45	1,921.59	62	323.07	841.79
21	45	15,030	12,910	17,009	132	2,188.37	1,402.49	64	257.95	527.93
22	53	19,520	16,570	21,202	128	2,870.41	1,753.22	61	327.11	790.08
23	43	18,930	15,550	20,086	129	2,628.01	1,707.89	65	313.35	606.77
24	44	19,950	16,940	21,541	127	2,822.10	1,818.24	64	309.16	694.70
25	48	22,910	18,570	23,587	127	3,074.40	1,970.06	64	340.37	763.97
26	43	23,800	19,310	24,385	126	3,188.73	2,053.70	64	369.13	765.90
27	43	25,710	21,110	25,426	120	3,297.18	2,170.02	66	360.05	767.11
28	39	26,930	22,780	26,260	115	3,511.03	2,231.37	64	403.93	875.73
29	31	20,970	18,300	21,951	120	2,805.03	1,875.24	67	343.25	586.54
30	23	16,800	14,340	16,263	113	2,232.38	1,371.92	61	257.93	602.53
31	29	26,720	20,970	24,978	119	3,523.97	2,141.98	61	344.52	1,037.47
32	33	26,910	22,510	26,688	119	3,578.13	2,287.81	64	405.94	884.38
33	20	17,560	14,440	17,173	119	2,347.44	1,488.58	63	265.33	593.53
34	19	17,440	14,900	17,474	117	2,346.23	1,513.66	65	272.85	559.72
35	15	14,550	12,310	15,758	128	1,926.29	1,337.30	69	228.31	360.68
36	16	18,870	15,760	18,721	119	2,467.41	1,610.85	65	274.26	582.30
37	8	10,420	7,900	9,648	122	1,289.45	815.23	63	140.11	334.11
38	11	13,160	10,300	11,441	111	1,636.41	985.28	60	175.42	475.71
39	11	15,960	13,000	14,907	115	2,037.75	1,289.34	63	254.42	493.99
40	8	10,950	7,920	8,654	109	1,346.74	740.23	55	111.27	495.24
41	5	9,230	6,640	8,444	127	1,143.10	726.11	64	134.21	282.78
42	5	7,840	4,790	6,070	127	969.40	513.24	53	82.67	373.49
43	5	8,730	6,210	7,883	127	1,046.36	682.15	65	105.17	259.04
44	1	1,110	740	922	125	129.61	83.42	64	19.72	26.47
45	7	12,300	7,480	10,061	135	1,555.70	878.04	56	173.88	503.78
46	3	4,960	3,720	4,529	122	633.66	369.49	58	72.12	192.05
47	1	2,810	950	1,213	128	377.07	102.79	27	20.31	253.97
48	--	--	--	--	--	--	--	--	--	--
49	--	--	--	--	--	--	--	--	--	--
50	1	1,870	1,190	1,433	120	236.08	135.84	58	33.46	66.78
51	--	--	--	--	--	--	--	--	--	--
52	1	2,530	1,640	2,402	146	318.23	207.56	65	41.10	69.57
53	1	2,370	1,220	2,363	194	302.61	201.10	66	22.42	79.09
54	1	2,180	1,170	1,600	137	264.01	145.74	55	35.14	83.13
Total or average	1,158	535,350	432,340	545,101	126	74,397.17	46,157.12	62	8,155.07	20,084.98

[1] As scaled by Bureau of Land Management scaler, east side log scaling rules, Scribner Oecimal C log scale.

[2] Lumber tally volume as percentage of net scale volume.

[3] Lumber cubic volume as percentage of log cubic volume.

Table 8—Log scale, lumber tally, and cubic volumes by scaling diameter for all log grades

Log scaling diameter (inches)	Number of logs	Log scale[1]		Lumber tally		Cubic volume				
		Gross	Net	Volume	Recovery ratio[2]	Log	Lumber	Lumber recovery ratio[3]	Sawdust	Residue
		- - - - Board feet - - - -			Percent	- - - Cubic feet - - -		Percent	- - - Cubic feet - - -	
6	48	1,100	1,000	1,605	160	325.42	135.25	42	25.98	164.19
7	35	1,060	1,010	1,406	139	253.82	117.94	46	23.32	112.56
8	105	3,170	3,080	5,231	170	914.96	433.33	47	81.68	399.95
9	123	5,470	5,220	8,119	156	1,339.07	674.12	50	127.35	537.60
10	144	8,440	8,000	11,262	141	1,745.80	931.74	53	174.22	639.84
11	152	11,190	10,440	15,160	145	2,289.61	1,260.67	55	234.29	794.65
12	168	14,550	13,630	19,348	142	2,800.04	1,605.83	57	291.11	903.10
13	171	18,640	17,410	24,202	139	3,397.21	2,005.18	59	351.74	1,040.29
14	182	22,830	20,860	29,822	143	4,118.22	2,461.08	60	437.74	1,219.40
15	167	25,930	23,710	30,879	130	4,246.54	2,559.29	60	437.73	1,249.52
16	194	35,240	32,600	44,287	136	5,708.51	3,658.56	64	633.10	1,416.85
17	161	33,880	30,860	40,649	132	5,439.04	3,400.70	63	561.82	1,476.52
18	194	46,920	42,840	54,419	127	7,127.84	4,522.06	63	761.39	1,844.39
19	176	48,000	42,980	54,439	127	7,191.93	4,530.83	63	752.10	1,909.00
20	206	66,090	59,050	72,349	123	9,377.28	6,068.88	65	1,025.96	2,282.44
21	169	59,480	54,360	65,480	120	8,446.45	5,498.99	65	935.51	2,011.95
22	174	66,380	60,000	73,243	122	9,459.22	6,141.38	65	1,050.79	2,267.05
23	174	75,840	67,450	80,889	120	10,378.11	6,831.68	66	1,172.81	2,373.62
24	160	75,340	69,390	82,318	119	10,540.07	6,973.22	66	1,192.63	2,374.22
25	167	88,600	79,280	91,545	115	11,873.73	7,762.31	65	1,291.95	2,819.47
26	161	92,070	81,270	94,512	116	12,212.87	8,003.61	66	1,389.70	2,819.56
27	146	92,750	82,750	92,916	112	11,988.22	7,938.71	66	1,368.09	2,681.42
28	142	93,950	84,400	94,237	112	12,385.94	8,027.53	65	1,384.84	2,973.57
29	137	94,690	85,110	99,787	117	12,665.60	8,552.70	68	1,489.12	2,623.78
30	111	82,500	37,460	83,460	114	11,008.21	7,158.90	65	1,293.21	2,556.10
31	119	101,100	86,590	98,980	114	13,264.90	8,542.28	64	1,441.19	3,281.43
32	121	100,880	88,580	101,960	115	13,480.12	8,756.21	65	1,514.12	3,209.79
33	111	98,370	85,240	98,467	116	13,329.19	8,482.61	64	1,507.25	3,339.33
34	100	93,930	83,490	95,936	115	12,911.67	8,285.09	64	1,436.61	3,189.97
35	96	95,360	83,380	97,686	117	13,075.09	8,409.94	64	1,514.10	3,151.05
36	81	84,490	72,850	83,072	114	11,209.42	7,187.99	64	1,245.64	2,775.79
37	77	90,700	77,770	89,050	115	11,679.17	7,707.85	66	1,363.82	2,607.50
38	67	80,610	66,230	78,218	118	10,757.02	6,746.53	63	1,207.68	2,802.81
39	60	83,050	70,750	81,536	115	11,091.82	7,068.26	64	1,304.08	2,719.48
40	55	75,140	61,560	72,644	118	9,553.46	6,298.63	66	1,119.96	2,134.87
41	44	66,890	55,890	62,753	112	8,857.41	5,455.05	62	976.20	2,426.16
42	37	54,680	43,990	49,713	113	6,919.25	4,330.24	63	777.45	1,811.56
43	37	59,400	50,040	54,016	108	7,517.76	4,695.08	62	797.02	2,025.66
44	28	44,090	37,520	40,148	107	5,679.85	3,532.00	62	657.81	1,490.04
45	36	63,670	50,130	59,614	119	8,352.88	5,172.29	62	892.09	2,288.50
46	20	32,450	28,410	29,705	105	4,149.03	2,590.20	62	485.39	1,073.44
47	22	40,370	32,820	37,650	115	5,344.32	3,288.47	62	616.30	1,439.55
48	20	40,240	35,010	37,477	107	5,274.39	3,267.47	62	537.77	1,469.15
49	13	26,850	23,750	25,955	109	3,521.97	2,259.41	64	356.33	906.23
50	14	26,450	21,520	23,386	109	3,342.29	2,060.76	62	381.76	899.77
51	8	17,520	14,380	17,087	119	2,288.41	1,460.26	64	238.29	589.86
52	9	18,450	14,530	16,033	110	2,366.50	1,401.75	59	254.75	710.00
53	5	11,570	7,580	10,379	137	1,611.93	898.57	56	157.41	555.95
54	8	18,010	14,150	14,736	104	2,301.66	1,284.02	56	212.95	804.69
55	4	12,430	11,350	11,650	103	1,628.03	1,003.09	62	137.65	487.29
56	4	9,560	6,550	7,825	120	1,280.02	667.95	52	123.05	489.02
57	2	4,570	4,020	4,445	111	593.07	381.29	64	53.37	158.41
58	1	3,150	1,760	2,179	124	373.32	185.25	50	21.29	166.78
59	3	9,150	7,480	8,750	117	1,147.87	754.85	66	122.57	270.45
60	--	--	--	--	--	--	--	--	--	--
61	--	--	--	--	--	--	--	--	--	--
62	1	3,620	2,940	3,486	119	432.99	291.87	67	38.41	102.71
63	--	--	--	--	--	--	--	--	--	--
64	2	7,740	6,890	7,245	105	1,011.13	621.84	61	95.82	293.47
65	1	3,190	2,800	2,672	95	434.62	228.55	53	31.33	174.74
66	--	--	--	--	--	--	--	--	--	--
67	--	--	--	--	--	--	--	--	--	--
68	1	4,370	3,480	3,526	101	623.85	293.12	47	40.50	290.93
Total or average	4,974	2,646,160	2,303,590	2,699,546	117	362,638.12	230,863.26	64	40,148.14	91,626.72

[1] As scaled by Bureau of Land Management scaler, east side log scaling rules, Scribner Decimal C log scale.

[2] Lumber tally volume as percentage of net scale volume.

[3] Lumber cubic volume as percentage of log cubic volume.

Table 9—Lumber grade yields by scaling diameter, log grade No. 1

Log scaling diameter (inches)	Number of logs	Lumber tally volume	B & 8tr. Select	C Select	D Select	Mould- ing	Factory Select	No. 1 Shop	No. 2 Shop	No. 3 Shop	Select Struc- tural1/	Construc- tion	Std.	Util.	Econ.
		Bd. ft.						*Percent of lumber tally volume*								
8	1	29	0	0	0	0	0	0	0	0	82.76	0	0	17.24	0
9	1	35	0	0	0	0	0	0	0	0	0	100.00	0	0	0
10	5	401	0	0	0	0	0	0	1.00	0	37.91	45.64	14.71	.75	0
11	7	709	0	1.13	4.65	.71	1.83	0	0	0	38.93	39.92	8.32	.71	3.81
12	5	599	1.00	3.01	1.00	2.17	0	0	0	0	39.57	42.74	7.68	0	2.84
13	9	1,236	0	0	.16	0	0	0	0	0	53.07	40.29	5.02	1.21	.24
14	8	1,161	.26	2.84	4.13	1.72	0	0	0	2.15	52.71	21.45	4.13	10.34	.26
15	12	2,431	.21	3.54	3.41	.62	0	0	0	0	38.42	36.82	6.42	9.46	1.11
16	9	2,096	1.72	4.91	.86	.19	0	0	0	0	51.00	27.67	6.58	3.20	3.86
17	12	2,873	.56	6.54	3.48	0	0	0	0	0	51.06	24.92	5.78	6.61	1.04
18	9	2,256	.66	2.62	.75	1.33	0	.58	0	.75	51.37	22.78	9.13	9.62	.40
19	10	2,758	3.88	7.00	5.04	4.31	0	0	.40	0	51.12	16.10	6.24	4.75	1.16
20	12	3,774	1.19	4.77	6.25	5.19	.85	1.01	1.27	.50	31.64	27.45	11.05	7.31	1.51
21	17	6,814	3.45	10.01	2.19	.85	0	.23	.40	0	50.65	15.04	10.41	4.65	2.13
22	9	4,126	6.08	15.12	6.64	5.19	.80	.10	0	.41	44.52	10.49	7.30	2.57	.78
23	17	7,250	7.53	15.79	3.43	3.52	0	.17	1.06	0	33.27	16.40	9.06	6.23	3.53
24	10	4,748	1.92	14.13	10.47	6.30	0	.63	1.01	0	33.78	17.29	8.61	4.95	.91
25	13	7,182	12.18	18.10	2.80	.29	.47	.28	.70	.84	31.24	19.84	7.10	4.22	1.94
26	19	10,323	12.23	13.88	5.80	2.43	1.84	1.36	1.46	1.08	26.21	19.91	6.12	4.82	2.85
27	14	7,769	11.25	12.58	4.74	5.84	2.79	1.26	2.57	.28	19.40	16.78	9.58	9.58	3.35
28	14	10,273	8.08	15.21	3.05	4.37	.73	1.66	1.45	.64	36.11	16.66	6.68	4.66	.69
29	18	12,127	7.36	14.10	8.18	3.99	3.48	1.34	4.46	.49	15.99	18.59	11.80	6.12	4.10
30	19	14,072	10.41	9.69	4.30	1.33	5.74	6.06	4.37	.43	25.55	16.94	5.33	7.34	2.50
31	11	9,754	20.72	17.71	3.63	1.76	2.99	1.25	1.07	.12	29.21	9.93	5.68	3.53	2.40
32	20	15,098	11.27	15.16	4.46	3.12	4.29	3.83	6.40	1.05	19.75	16.19	3.93	7.84	2.71
33	18	16,420	19.24	10.86	5.29	4.76	4.35	3.45	3.64	1.65	12.06	15.23	8.28	6.61	4.56
34	13	10,608	22.95	13.41	2.71	3.44	7.31	4.32	2.42	.59	15.39	13.68	5.46	6.43	1.89
35	21	20,550	17.34	14.23	4.33	6.14	4.73	3.06	3.18	.34	19.08	11.07	6.57	7.09	2.85
36	19	18,579	17.90	14.17	3.68	3.80	2.68	5.48	7.17	1.91	16.57	13.42	5.40	5.54	2.28
37	19	20,957	25.90	15.05	7.07	1.75	3.96	4.87	3.14	2.14	10.60	12.74	4.79	5.45	2.55
38	20	24,261	20.58	17.48	6.89	1.84	2.49	2.64	2.88	.50	11.48	15.48	6.50	7.44	3.80
39	16	19,033	23.15	17.19	4.90	3.16	4.84	3.52	2.95	.37	12.18	11.58	5.04	7.92	3.18
40	17	20,225	21.80	20.06	6.31	6.96	3.04	2.89	3.99	1.49	9.87	10.55	4.43	5.62	2.98
41	16	19,870	22.78	18.57	5.01	5.74	4.80	3.76	3.60	.51	13.15	8.59	4.28	7.43	1.77
42	11	14,850	17.20	17.16	12.22	7.56	.54	.45	1.35	.32	10.11	15.25	5.58	8.13	4.14
43	15	23,875	33.55	19.18	7.72	3.37	3.33	2.18	3.34	.79	8.56	6.72	5.60	3.76	1.89
44	12	18,609	29.52	18.62	7.00	7.27	3.18	2.90	2.56	.92	9.25	9.02	3.83	4.25	1.69
45	9	14,589	30.76	20.58	5.71	6.52	1.61	1.90	2.73	1.12	7.26	7.62	4.26	5.44	4.49
46	8	11,646	32.13	14.16	3.51	4.43	5.64	6.72	6.09	.48	11.15	5.55	3.86	4.67	1.60
47	10	17,208	39.47	15.17	3.91	7.51	3.59	3.86	3.07	.31	8.00	7.22	2.99	2.88	2.02
48	13	23,774	28.17	20.62	5.10	5.50	2.99	3.92	4.50	.56	9.38	6.62	3.78	5.65	3.19
49	7	14,897	34.46	21.61	4.71	.24	2.12	2.74	4.14	.67	11.75	7.26	3.11	4.66	2.54
50	3	4,667	38.44	12.11	1.39	0	11.96	8.51	6.51	0	5.31	4.84	3.30	6.62	1.01
51	4	9,254	36.14	24.12	2.12	.04	4.26	3.78	2.78	.13	8.80	6.19	4.32	5.85	1.48
52	7	12,254	36.40	19.06	6.15	5.23	2.27	1.27	3.84	.69	4.28	7.39	4.39	5.70	3.32
53	2	3,550	24.37	13.49	4.56	13.86	6.62	5.18	5.35	.11	3.61	3.04	2.34	15.21	2.25
54	5	10,520	38.12	20.19	5.57	3.45	4.64	3.98	2.23	.47	7.26	6.83	1.61	3.68	1.98
55	4	11,650	53.12	23.16	2.32	0	2.70	1.27	.37	0	5.76	3.09	.87	6.03	1.32
56	1	1,836	72.88	17.10	0	0	.38	0	.60	0	3.43	1.74	1.58	1.91	.38
57	2	4,445	61.12	17.59	2.11	0	5.78	.88	1.24	.79	5.69	2.00	.40	2.11	.27
58	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
59	2	5,526	30.44	12.69	1.01	0	12.54	11.27	4.11	.47	7.82	4.25	2.77	7.51	5.12
60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
62	1	3,486	40.91	14.37	2.95	1.95	0	0	0	0	.46	10.47	8.49	9.04	11.36
63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
64	1	3,602	61.10	17.13	2.75	1.44	0	0	0	0	1.72	1.75	2.75	6.33	5.02
65	1	2,672	43.04	25.94	8.31	0	5.35	1.50	1.38	2.62	3.48	1.38	.94	3.85	2.21
66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
68	1	3,526	44.07	28.16	3.91	1.64	0	0	0	0	2.21	2.67	4.03	5.30	8.00
Total or average	559	516,833	23.83	16.36	5.14	3.84	3.29	2.93	3.08	.70	15.42	11.59	5.25	5.87	2.70

1/ Includes 1-inch Select Merchantable lumber.

Table 10—Lumber grade yields by scaling diameter, log grade No. 2

Log scaling diameter (inches)	Number of logs	Lumber tally volume	Lumber grade												
			8 & 8tr. Select	C Select	O Select	Mould-ing	Factory Select	No. 1 Shop	No. 2 Shop	No. 3 Shop	Select Struc-tural[1]	Construc-tion	Std.	Util.	Econ.
		Bd. ft.	- Percent of lumber tally volume -
8	4	113	0	0	0	0	0	0	0	0	20.35	46.02	23.01	7.96	2.65
9	9	628	0	2.07	0	0	0	0	2.07	0	16.72	39.49	28.50	10.35	.80
10	14	1,227	.98	.33	.41	.41	0	0	0	0	34.56	37.73	16.14	5.30	4.16
11	15	1,344	0	.89	1.26	0	0	0	0	0	31.70	42.11	11.76	10.49	1.79
12	21	2,515	.16	1.71	1.99	.48	0	.12	0	0	39.36	36.82	13.52	4.85	.99
13	22	2,867	0	1.57	2.96	.56	0	0	0	0	24.14	42.20	18.84	7.15	2.58
14	27	4,209	.10	1.45	.40	.95	0	0	0	.40	32.81	33.67	13.52	11.26	5.44
15	17	2,939	0	1.70	1.94	.88	0	.58	0	1.36	36.00	31.98	12.11	6.26	7.18
16	24	4,918	.67	2.20	2.54	1.28	0	0	.35	.81	34.95	37.43	12.57	4.58	2.62
17	25	6,249	.21	1.52	.98	.80	.11	.26	1.17	.72	38.23	36.21	9.28	8.02	2.50
18	29	8,067	.25	3.17	3.17	1.95	0	.06	1.10	.94	37.14	32.59	10.26	7.19	2.17
19	30	8,840	.40	2.14	2.25	3.05	.23	.19	1.38	.70	36.78	31.89	10.42	8.11	2.47
20	33	11,339	.84	4.65	3.16	1.62	.07	.61	2.10	.36	36.16	28.34	12.66	6.91	2.52
21	41	14,578	1.78	4.97	4.81	4.09	.16	1.44	2.79	.86	29.41	32.63	7.58	8.09	1.39
22	39	15,516	.43	3.57	3.04	2.12	.03	.18	2.15	.43	34.20	31.66	11.68	7.86	2.66
23	40	18,176	2.78	6.12	4.98	1.47	.24	.40	1.60	.28	33.29	27.17	10.12	8.42	3.14
24	35	18,285	5.27	7.48	5.82	3.23	.43	.48	.62	.55	32.02	28.56	8.25	5.46	1.82
25	41	22,857	3.66	6.57	5.61	2.15	.35	2.04	3.25	.60	22.87	32.21	10.12	6.65	3.92
26	38	21,778	3.52	6.37	4.27	5.48	.73	.85	1.32	.62	25.64	29.25	12.47	7.37	2.10
27	38	24,854	5.62	9.71	5.25	2.04	1.19	2.20	2.03	.49	24.58	26.39	8.96	9.47	2.06
28	42	25,979	4.95	7.87	4.03	3.81	2.11	3.14	3.14	.65	19.06	25.40	10.64	9.45	6.03
29	41	30,603	5.12	9.71	3.77	2.55	2.59	5.22	3.23	.44	20.59	27.14	10.40	7.24	1.99
30	31	22,244	5.08	9.99	5.01	8.48	2.88	3.83	5.61	.48	13.70	21.79	10.64	8.80	3.71
31	45	34,325	5.84	7.01	4.62	5.53	3.87	5.75	6.42	.81	15.94	21.54	10.50	7.84	4.34
32	34	27,321	6.86	11.95	5.27	2.86	2.71	2.90	5.56	1.39	20.22	21.88	8.69	6.36	3.36
33	38	32,690	11.67	10.84	7.57	4.30	2.48	2.20	3.50	1.15	15.26	17.36	7.98	11.76	3.94
34	34	32,594	12.78	13.55	4.63	5.97	2.27	3.98	4.36	.47	15.57	16.75	7.97	7.96	3.73
35	40	39,714	10.12	14.62	6.47	4.45	2.42	2.81	5.55	1.21	14.63	17.08	7.18	10.04	3.42
36	22	28,846	12.58	11.50	4.58	4.93	2.01	5.47	6.59	.73	11.80	18.37	6.99	10.70	3.75
37	27	29,099	7.13	8.93	5.69	5.80	3.41	4.19	5.80	1.82	14.25	19.86	10.04	8.54	4.53
38	20	22,226	15.49	12.06	6.92	3.62	3.24	4.49	4.07	.72	11.03	14.35	10.86	9.64	3.50
39	18	26,765	16.37	19.34	5.79	6.63	1.91	2.21	1.94	.61	13.20	15.11	6.47	6.80	3.61
40	17	27,105	23.12	10.46	6.93	4.08	1.95	2.91	3.42	.26	12.46	11.66	7.34	13.15	2.26
41	13	18,625	9.42	18.90	7.84	8.37	2.41	3.00	2.06	.94	9.79	16.16	8.32	8.27	4.53
42	11	13,877	15.28	14.84	3.44	5.71	4.47	6.24	10.45	2.14	9.48	11.04	7.06	6.39	3.45
43	13	17,489	10.03	10.30	5.08	6.46	5.27	7.26	10.23	2.22	8.86	11.96	8.94	10.80	2.58
44	9	10,915	11.74	20.55	6.79	5.69	3.79	4.31	4.34	.60	3.80	6.85	8.21	17.98	5.35
45	12	20,520	13.33	11.37	6.22	.46	4.92	2.32	2.70	.96	9.16	19.34	14.00	12.98	2.24
46	6	9,040	9.82	9.83	4.21	9.42	9.16	8.01	6.47	3.89	4.90	12.48	6.25	9.99	5.55
47	6	10,940	16.89	14.17	8.98	13.41	1.83	3.98	5.57	2.86	7.81	7.18	6.50	8.15	2.69
48	6	10,547	12.48	15.83	9.32	.13	2.08	2.22	3.20	.25	10.60	17.44	10.49	12.98	3.00
49	5	9,302	16.28	16.04	2.80	.24	9.56	5.96	8.73	.85	7.46	8.19	7.98	9.25	6.69
50	8	14,269	18.43	14.77	5.61	9.94	5.40	9.32	8.00	.84	7.82	6.49	4.36	5.48	3.55
51	1	1,912	39.23	24.22	1.15	0	8.89	.47	0	0	5.65	11.14	2.93	2.93	3.40
52	1	1,377	32.97	15.32	1.45	0	6.39	11.62	13.58	3.41	0	4.94	1.74	5.30	3.27
53	1	1,879	32.57	24.32	2.24	0	6.28	3.30	3.73	0	3.57	7.08	3.99	10.64	2.29
54	2	2,616	27.41	28.63	2.71	0	12.92	1.64	.88	1.64	4.51	8.26	2.37	7.91	1.11
55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
58	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
59	1	3,224	18.11	17.56	5.61	1.89	0	0	0	0	0	15.60	8.59	21.65	10.98
60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
64	1	3,643	32.75	15.07	.66	0	10.49	6.26	4.28	.25	5.98	3.49	3.84	13.23	3.71
Total or average	1,047	712,985	9.23	10.59	5.19	4.30	2.51	3.22	4.03	.89	17.79	20.73	9.17	8.93	3.43

[1] Includes 1-inch Select Merchantable lumber.

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Table 11—Lumber grade yields by scaling diameter, log grade No. 3

Log scaling diameter (inches)	Number of logs	Lumber tally volume	B & Btr. Select	C Select	D Select	Mould- ing	Factory Select	No. 1 Shop	No. 2 Shop	No. 3 Shop	Select Struc- tural[1]	Construc- tion	Std.	Util.	Econ.
		Bd. ft.	- - - - - - - - - - - - - - - - - - *Percent of lumber tally volume* -
6	42	1,351	0.89	1.78	0.59	0	0	0	0	0	8.29	55.81	16.73	12.58	3.33
7	34	1,324	0	.60	0	0	0	0	0	0	6.65	46.90	27.49	11.78	6.57
8	86	4,228	.33	.57	.54	.43	.12	0	0	0	9.46	53.64	22.19	10.41	2.32
9	91	5,555	.41	.83	.18	.11	0	.31	.45	.22	12.44	47.31	24.70	10.93	2.12
10	103	7,940	.10	.76	.48	.21	0	0	.14	.14	11.94	47.61	21.74	14.27	2.62
11	100	9,902	.66	.78	.37	.13	.12	0	.12	0	13.03	50.39	23.14	8.98	2.28
12	105	11,886	.48	.21	.51	.28	0	.24	.14	.20	16.33	48.12	20.76	10.33	2.39
13	100	13,915	.04	.63	.72	.51	0	.05	.12	0	16.91	47.78	20.95	9.03	3.26
14	98	15,994	.11	.66	.48	.92	.09	0	.08	.58	12.15	47.88	23.38	11.24	2.45
15	87	15,821	.23	.37	.63	.58	0	.07	.25	.37	14.95	44.68	23.81	10.73	3.33
16	108	24,901	.18	.36	1.11	.31	.08	.15	.31	.44	14.74	44.63	23.87	11.26	2.57
17	75	19,231	.22	.86	.80	.98	0	.34	1.13	.47	18.98	41.39	22.01	10.61	2.22
18	103	29,629	.09	.75	.69	.28	0	.20	1.30	.44	14.88	44.84	20.26	12.21	2.75
19	84	26,532	.28	1.16	1.11	1.13	.05	.27	1.24	.82	16.61	43.19	20.92	10.64	2.57
20	95	34,326	.45	.86	.84	.71	.13	.65	1.93	.80	16.61	40.31	22.53	11.26	2.92
21	66	27,079	.75	2.01	1.73	.99	.09	.54	1.99	.43	12.25	40.67	22.63	12.32	3.60
22	73	32,399	.46	1.59	1.30	1.01	.15	.49	3.01	.50	15.33	40.10	21.32	11.66	3.07
23	74	35,377	1.06	1.47	1.71	.86	.13	1.14	3.23	.29	37.27	20.76	14.24	2.91	
24	71	37,744	1.47	2.23	1.62	1.49	.25	1.56	4.11	.81	18.05	39.06	17.94	8.77	2.63
25	65	37,919	1.07	2.30	2.30	.92	.64	1.06	3.25	.54	13.18	39.48	17.91	12.94	4.40
26	61	38,026	1.72	3.35	2.93	1.87	.28	1.68	5.14	.65	14.46	32.20	18.16	14.83	2.72
27	51	34,867	2.11	4.06	2.30	2.02	.70	2.82	4.72	1.11	11.58	30.77	21.49	11.15	5.17
28	47	31,725	2.42	5.17	3.14	1.99	1.26	2.82	3.82	.35	12.40	30.33	18.22	13.91	4.17
29	47	35,106	2.28	5.18	3.09	2.26	1.22	3.16	4.39	1.74	13.75	28.62	16.01	13.45	4.85
30	38	30,881	2.47	5.28	3.83	3.96	1.02	3.56	5.97	.84	10.97	25.11	17.17	14.38	5.44
31	34	29,923	3.75	7.62	4.39	2.13	.76	3.94	7.10	1.16	9.67	30.91	14.87	10.62	3.06
32	34	32,853	3.77	5.11	3.02	1.90	1.07	3.91	4.76	.90	10.98	26.41	17.61	15.66	4.92
33	35	32,184	2.99	6.49	4.11	3.15	.64	3.13	6.84	1.06	9.85	23.69	17.15	15.48	5.43
34	34	35,260	7.05	6.80	3.59	2.19	1.69	1.97	4.52	.71	6.83	23.10	21.53	16.63	3.40
35	20	21,664	4.24	5.95	5.26	1.07	.45	3.08	2.92	.90	8.93	23.42	16.56	22.74	4.50
36	24	24,926	1.81	3.59	3.80	4.83	2.42	6.70	7.32	2.04	5.73	19.89	16.36	18.82	6.68
37	23	29,346	5.23	8.58	4.69	4.57	2.59	6.44	4.89	.81	5.28	28.15	14.45	10.67	3.65
38	16	20,290	4.26	9.88	4.85	2.45	1.15	4.71	4.39	.60	4.22	20.51	17.82	17.08	8.07
39	15	20,831	1.30	5.12	3.01	4.11	1.71	4.54	4.76	.33	5.57	22.83	16.35	21.22	9.16
40	13	16,660	1.96	4.57	4.10	6.39	1.45	5.96	10.28	2.70	5.59	13.04	17.33	16.35	10.28
41	10	15,814	6.93	10.64	4.39	3.97	1.23	5.34	3.90	1.15	2.52	17.49	20.70	17.25	3.43
42	10	14,916	5.77	12.06	6.22	3.33	1.01	3.47	5.52	.48	11.30	16.53	8.66	16.32	9.33
43	4	4,769	2.33	19.63	5.47	0	.69	4.86	5.83	2.14	.71	1.93	9.98	35.21	11.22
44	6	9,702	4.12	16.32	5.66	6.85	1.18	5.45	10.80	1.59	5.28	13.74	13.07	11.81	4.13
45	8	14,444	5.70	12.68	5.83	4.02	2.71	5.36	5.86	1.28	5.18	13.11	11.50	23.43	3.36
46	3	4,490	4.32	14.90	7.88	17.39	1.11	4.43	11.92	1.11	3.23	6.77	6.26	12.23	8.44
47	5	8,289	1.31	6.27	7.18	4.55	.48	5.53	2.64	1.24	.70	7.65	13.78	35.94	12.73
48	1	3,156	8.68	21.89	17.30	0	0	0	0	0	3.17	11.31	19.93	13.97	3.74
49	1	1,756	12.19	20.16	18.05	23.35	0	1.31	2.33	0	7.80	3.47	2.51	4.04	4.78
50	2	3,017	2.55	12.86	4.31	.30	.36	1.39	2.19	3.45	1.59	7.89	9.21	32.62	21.28
51	3	5,921	4.59	7.99	4.53	.07	0	0	0	.20	1.76	12.60	12.23	42.10	13.93
52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
53	1	2,587	6.84	14.15	6.73	0	0	0	0	0	0	16.08	5.88	37.73	12.60
54	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
56	3	5,992	.95	12.83	5.21	0	5.76	.63	4.49	.13	1.75	11.48	11.63	34.88	10.25
57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
58	1	2,179	2.16	7.99	.78	.37	0	0	0	0	2.39	13.95	7.34	29.42	35.61
Total or average	2,210	924,627	2.26	4.53	2.88	2.09	.76	2.37	3.80	.79	11.41	31.63	18.55	14.40	4.52

[1] Includes 1-inch Select Merchantable lumber.

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Table 12—Lumber grade yields by scaling diameter, log grade No. 4

Log scaling diameter (inches)	Number of logs	Lumber tally volume	Lumber grade												
			8 & 8tr. Select	C Select	D Select	Mould-ing	Factory Select	No. 1 Shop	No. 2 Shop	No. 3 Shop	Select Structural[1]	Construc-tion	Std.	Util.	Econ.
		Bd. ft.	- Percent of lumber tally volume -												
6	6	254	0	0	0	0	0	0	0	0	0	51.97	20.47	20.47	7.09
7	1	82	0	0	0	0	0	0	0	0	0	40.24	41.46	4.88	13.41
8	14	861	0	0	0	0	0	0	0	0	7.55	36.93	30.08	19.51	5.92
9	22	1,901	0	0	0	0	0	0	0	0	2.31	29.77	42.87	18.62	6.42
10	22	1,694	0	.18	0	.41	0	0	0	0	1.24	29.75	31.35	26.33	10.74
11	30	3,205	0	1.34	0	0	0	0	0	0	.31	28.17	33.48	28.14	8.55
12	37	4,348	0	.69	.32	.76	0	0	0	.28	3.36	26.43	33.92	28.13	6.12
13	40	6,184	.16	.24	.19	.10	0	.15	0	.24	2.81	34.15	32.63	22.36	6.95
14	49	8,458	.05	.31	.46	.38	0	0	0	.09	5.04	27.02	34.31	21.81	10.53
15	51	9,688	.37	.56	.18	0	0	.09	0	0	2.36	37.52	30.70	22.00	6.22
16	53	12,372	.08	.27	.12	0	0	.13	.95	.36	4.00	24.93	35.23	26.33	7.60
17	49	12,296	0	.38	.54	.15	.11	0	.16	.16	4.03	22.58	31.08	30.80	10.00
18	53	14,467	.63	.62	.19	.44	0	0	.91	.59	4.35	28.12	28.94	27.39	7.81
19	52	16,309	.18	.49	.75	.20	.03	.02	1.23	.37	1.96	23.50	34.51	26.70	10.06
20	66	22,910	.16	1.01	.60	.85	0	.38	2.50	1.65	4.74	25.17	27.54	26.83	8.56
21	45	17,009	.22	.94	.73	.26	.31	.04	2.25	.58	4.93	26.18	22.61	31.83	9.12
22	53	21,202	.42	.28	.51	.45	.09	.32	3.11	1.41	5.49	25.69	22.65	29.32	10.25
23	43	20,086	.30	.79	1.15	.85	.03	.37	4.61	1.63	4.32	20.10	29.12	25.67	11.06
24	44	21,541	.37	.98	1.34	1.20	.66	.96	4.61	1.50	3.56	23.86	25.21	28.03	7.73
25	48	23,587	.27	1.31	.94	1.02	.08	1.63	4.29	1.59	3.20	27.07	25.77	23.67	9.18
26	43	24,385	.32	.96	1.41	.90	.11	.81	4.65	2.18	3.05	20.98	29.49	25.39	9.74
27	43	25,426	.54	1.91	.94	1.87	.49	2.59	8.08	2.12	4.24	20.04	19.62	30.21	7.37
28	39	26,260	.61	1.99	1.07	.98	1.81	2.76	6.54	.87	3.87	23.50	22.88	23.11	10.00
29	31	21,951	1.33	1.94	1.37	1.47	.95	4.06	10.33	1.92	4.48	18.01	21.06	22.02	11.07
30	23	16,263	.53	2.57	1.58	1.69	.70	2.95	5.42	1.56	3.41	17.28	23.72	26.00	12.59
31	29	24,978	1.78	3.47	2.43	1.44	.68	3.23	8.20	.92	2.74	13.88	25.83	25.78	9.63
32	33	26,688	1.16	2.14	1.46	1.18	1.49	3.09	8.91	1.47	3.02	15.70	20.54	28.86	10.97
33	20	17,173	1.56	2.83	2.18	2.77	1.05	6.21	8.88	1.95	3.72	18.60	20.29	19.65	10.31
34	19	17,474	.88	2.33	1.64	1.64	2.33	6.49	13.23	3.00	3.62	10.87	18.99	27.21	7.78
35	15	15,758	1.03	2.44	3.45	2.46	.65	2.61	4.58	.52	1.18	23.22	21.69	26.55	9.61
36	16	18,721	.86	4.07	2.89	2.20	2.08	2.99	8.50	1.98	1.63	20.07	15.46	23.89	13.38
37	8	9,648	1.13	9.14	2.21	.12	.83	1.83	4.46	.55	1.41	11.89	18.67	33.54	14.22
38	11	11,441	1.67	5.70	2.10	3.66	2.48	5.14	6.84	1.46	4.22	11.91	14.61	29.28	10.93
39	11	14,907	.62	4.65	2.58	4.14	2.15	4.07	7.88	1.99	.82	9.73	8.26	38.94	14.17
40	8	8,654	.99	3.95	3.17	.08	.32	4.34	5.81	1.12	1.31	20.04	17.56	35.78	5.52
41	5	8,444	2.90	4.43	4.01	1.16	1.79	4.62	6.08	1.31	2.31	11.43	12.28	29.81	17.87
42	5	6,070	3.64	6.23	2.41	0	0	2.75	5.44	1.33	2.97	16.51	18.39	29.32	11.02
43	5	7,883	1.33	6.29	2.26	3.39	5.63	7.43	8.75	3.07	2.21	8.26	13.93	29.77	7.67
44	1	922	5.75	1.41	2.60	19.31	2.06	6.94	23.54	4.34	0	22.99	7.81	3.25	0
45	7	10,061	1.90	4.04	2.48	.87	3.69	2.94	9.85	3.30	.57	12.53	7.12	31.70	19.01
46	3	4,529	0	.62	0	2.72	0	.62	2.45	5.65	1.26	7.64	24.57	35.02	19.45
47	1	1,213	4.45	2.72	7.01	0	.66	4.04	2.23	3.13	0	.49	4.29	55.73	15.25
48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
50	1	1,433	0	.28	.63	10.40	0	18.49	44.52	10.68	0	0	1.12	7.47	6.42
51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
52	1	2,402	0	3.79	2.87	0	0	0	0	0	0	0	4.75	74.52	14.07
53	1	2,363	4.23	4.15	.80	.34	0	0	0	0	.68	1.82	8.84	37.96	41.18
54	1	1,600	.81	0	2.06	33.31	0	14.25	16.75	3.31	0	6.19	5.25	13.25	4.81
Total or average	1,158	545,101	.78	2.13	1.44	1.37	.84	2.28	5.56	1.44	3.25	20.22	23.12	27.33	10.24

[1] Includes 1-inch Select Merchantable lumber.

Table 13—Lumber grade yields by scaling diameter for all log grades

Log scaling diameter (inches)	Number of logs	Lumber tally volume	B & Btr. Select	C Select	D Select	Mould-ing	Factory Select	No. 1 Shop	No. 2 Shop	No. 3 Shop	Select Structural[1]	Construc-tion	Std.	Util.	Econ.
		Bd. ft.	- Percent of lumber tally volume -												
6	48	1,605	0.75	1.50	0.50	0	0	0	0	0	6.98	55.20	17.32	13.83	3.93
7	35	1,406	0	.57	0	0	0	0	0	0	6.26	46.51	28.31	11.38	6.97
8	105	5,231	.27	.46	.44	.34	.10	0	0	0	9.79	50.43	23.38	11.89	2.91
9	123	8,119	.28	.73	.12	.07	0	.21	.47	.15	10.35	42.83	29.14	12.64	3.02
10	144	11,262	.18	.59	.38	.26	0	0	.13	.10	13.72	43.78	22.32	14.62	3.92
11	152	15,160	.43	.92	.57	.12	.16	0	.08	0	13.21	44.47	23.62	12.78	3.63
12	168	19,348	.35	.60	.68	.47	0	.16	.09	.19	17.13	41.61	22.37	13.30	3.06
13	171	24,202	.07	.61	.82	.38	0	.07	.07	.06	16.01	43.26	22.87	11.82	3.97
14	182	29,822	.09	.75	.60	.80	.05	0	.04	.48	14.63	38.93	24.34	14.20	5.08
15	167	30,879	.25	.80	.83	.43	0	.12	.13	.32	14.85	40.61	23.49	13.74	4.43
16	194	44,287	.28	.76	.98	.32	.04	.12	.48	.44	15.70	37.52	24.97	14.35	4.04
17	161	40,649	.17	1.22	.94	.63	.05	.20	.76	.38	19.68	33.74	21.65	16.04	4.53
18	194	54,149	.28	1.15	.93	.61	0	.14	1.11	.57	17.60	37.67	20.63	15.40	3.91
19	176	54,439	.45	1.41	1.39	1.33	.07	.17	1.22	.62	17.24	34.08	22.54	14.74	4.72
20	206	72,349	.46	1.70	1.41	1.13	.12	.58	2.10	.98	16.70	32.97	21.97	15.30	4.57
21	169	65,480	1.12	3.22	2.20	1.48	.15	.58	2.07	.52	18.16	32.45	18.00	15.65	4.39
22	174	73,243	.76	2.39	1.74	1.32	.14	.35	2.69	.74	18.13	32.47	18.88	15.46	4.93
23	174	80,889	1.84	3.63	2.46	1.24	.12	.70	3.01	.59	18.06	28.87	19.40	15.06	5.04
24	160	82,318	2.05	3.76	2.99	2.08	.38	1.11	3.29	.89	18.27	31.49	17.15	12.86	3.68
25	167	91,545	2.38	4.35	2.82	1.20	.41	1.39	3.32	.85	14.45	32.93	17.14	13.45	5.32
26	161	94,512	2.92	4.58	3.16	2.51	.51	1.23	3.73	1.08	15.37	27.29	18.46	14.74	4.40
27	146	92,916	3.38	5.70	2.92	2.30	.95	2.46	4.74	1.15	13.70	25.49	16.63	15.78	4.78
28	142	94,237	3.23	6.12	2.80	2.47	1.59	2.69	4.13	.61	14.44	25.58	16.17	14.24	5.93
29	137	99,787	3.56	6.94	3.54	2.39	1.86	3.77	5.35	1.23	14.08	24.61	14.89	12.54	5.25
30	111	83,460	4.13	6.75	3.79	4.28	2.25	3.93	5.50	.82	12.69	21.32	14.71	13.97	5.88
31	119	98,980	5.65	7.35	3.90	3.10	2.04	4.12	6.55	.88	12.02	21.30	15.21	12.78	5.10
32	121	101,960	5.03	7.65	3.43	2.15	2.10	3.41	6.30	1.20	12.67	20.88	13.96	15.46	5.76
33	111	98,467	8.33	8.03	5.12	3.73	1.94	3.41	5.55	1.34	10.94	19.29	13.17	13.49	5.64
34	100	95,936	9.63	9.01	3.49	3.51	2.63	3.73	5.82	1.03	10.16	17.67	14.68	14.48	4.14
35	96	97,686	8.87	10.65	5.26	3.73	2.18	2.89	4.31	.85	12.13	18.21	11.47	14.90	4.54
36	81	83,072	7.90	8.05	3.77	4.03	2.30	5.28	7.37	1.67	8.76	18.10	11.36	14.95	6.47
37	77	89,050	10.27	10.28	5.31	3.82	2.99	4.83	4.73	1.43	9.04	20.06	11.19	11.22	4.82
38	67	78,218	12.13	12.25	5.67	2.77	2.35	4.07	4.19	.73	8.41	15.94	11.86	13.76	5.87
39	60	81,536	11.22	12.52	4.29	4.72	2.59	3.45	3.98	.73	8.75	15.28	8.99	16.62	6.86
40	55	72,644	15.26	11.01	5.66	4.94	1.95	3.78	5.44	1.27	8.83	12.67	10.04	14.48	4.69
41	44	62,753	12.14	14.77	5.83	5.46	2.79	4.05	3.55	.91	8.02	13.46	10.69	13.17	5.17
42	37	49,713	11.58	13.65	6.77	4.85	1.71	3.25	5.64	1.00	9.42	14.61	8.48	12.69	6.34
43	37	54,016	18.48	14.46	5.87	4.08	4.06	4.83	6.58	1.71	7.04	8.22	8.29	12.61	3.78
44	28	40,148	18.00	18.19	6.52	7.01	2.83	3.99	5.52	1.07	6.60	9.89	7.35	9.79	3.24
45	36	59,614	13.82	12.70	5.37	2.88	3.36	3.06	4.68	1.47	6.28	13.81	9.85	16.82	5.89
46	20	29,705	16.24	10.89	3.85	7.65	5.17	5.84	6.53	2.40	6.54	8.16	8.11	12.06	6.56
47	22	37,650	23.38	12.52	6.20	8.33	2.30	4.27	3.67	1.35	6.08	7.09	6.43	13.39	5.00
48	20	37,477	22.11	19.38	7.31	3.52	2.48	3.11	3.76	.43	9.20	10.06	7.03	8.41	3.18
49	13	25,955	26.43	19.51	4.92	1.80	4.64	3.80	5.66	.69	9.95	7.34	4.81	6.26	4.18
50	14	23,386	19.25	13.11	4.29	6.74	5.73	8.70	9.19	1.61	6.04	5.94	4.58	9.33	5.50
51	8	17,087	25.55	18.54	2.84	.05	3.30	2.10	1.50	.14	6.00	8.97	6.91	18.08	6.01
52	9	16,033	30.65	16.45	5.26	4.00	2.28	1.97	4.10	.82	3.27	6.07	4.22	15.97	4.93
53	5	10,379	16.90	13.49	3.83	4.82	3.40	2.37	2.51	.04	2.03	6.74	5.00	25.18	13.70
54	8	14,736	32.17	19.50	4.68	6.08	5.61	4.68	3.57	.98	5.99	7.01	2.14	5.47	2.13
55	4	11,650	53.12	23.16	2.32	0	2.70	1.27	.37	0	5.76	3.09	.87	6.03	1.32
56	4	7,828	17.82	13.83	3.99	0	4.50	.49	3.58	.10	2.15	9.20	9.27	27.15	7.93
57	2	4,445	61.12	17.59	2.11	0	5.78	.88	1.24	.79	5.69	2.00	.40	2.11	.27
58	1	2,179	2.16	7.99	.78	.37	0	0	0	0	2.39	13.95	7.34	29.42	35.61
59	3	8,750	25.90	14.48	2.71	.70	7.92	7.12	2.59	.30	4.94	8.43	4.91	12.72	7.28
60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
62	1	3,486	40.91	14.37	2.95	1.95	0	0	0	0	.46	10.47	8.49	9.04	11.36
63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
64	2	7,245	46.85	16.09	1.70	.72	5.27	3.15	2.15	.12	3.86	2.62	3.30	9.80	4.36
65	1	2,672	43.04	25.94	8.31	0	5.35	1.50	1.38	2.62	3.48	1.38	.94	3.85	2.21
66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
68	1	3,526	44.07	28.16	3.91	1.64	0	0	0	0	2.21	2.67	4.03	5.30	8.00
Total or average	4,974	2,699,546	7.93	7.91	3.63	2.87	1.72	2.68	4.08	.93	12.21	22.61	14.45	13.93	5.04

[1] Includes 1-inch Select Merchantable lumber.

Table 14—Cubic volumes by scaling diameter, log grade 1

(In cubic meters)

Scaling diameter		Logs	Lumber	Sawdust	Residue
Inches	Centimeters				
8	20.32	0.20	0.06	0.01	0.12
9	22.86	.17	.08	.01	.07
10	25.40	1.56	.95	.16	.43
11	27.94	2.86	1.67	.30	.88
12	30.48	2.10	1.43	.25	.41
13	33.02	5.16	2.95	.43	1.77
14	35.56	5.13	2.78	.43	1.90
15	38.10	9.47	5.80	.92	2.74
16	40.64	7.52	5.01	.74	1.77
17	43.18	12.00	6.87	1.04	4.09
18	45.72	8.60	5.41	.86	2.32
19	48.26	11.01	6.52	1.08	3.40
20	50.80	15.59	9.16	1.48	4.94
21	53.34	24.35	16.51	2.49	5.34
22	55.88	14.71	10.01	1.56	3.14
23	58.42	28.66	17.32	2.83	8.50
24	60.96	18.50	11.48	1.88	5.13
25	63.50	26.88	17.22	2.88	6.85
26	66.04	39.86	25.01	3.96	10.87
27	68.58	29.44	18.95	3.21	7.26
28	71.12	36.79	24.86	3.75	8.17
29	73.66	44.35	29.59	5.34	9.42
30	76.20	53.24	34.31	5.24	13.68
31	78.74	36.67	23.69	3.53	9.44
32	81.28	56.89	36.80	6.09	13.99
33	83.82	64.15	39.85	7.03	17.26
34	86.36	42.26	26.14	4.33	11.79
35	88.90	78.18	50.48	8.65	19.04
36	91.44	72.62	45.73	7.92	18.96
37	93.98	81.08	51.39	9.18	20.49
38	96.52	96.39	59.09	10.18	27.11
39	99.06	71.67	46.79	8.11	16.76
40	101.60	76.56	50.55	9.16	16.84
41	104.14	81.10	48.95	8.23	23.91
42	106.68	55.50	36.52	6.07	12.90
43	109.22	88.89	58.67	9.49	20.72
44	111.76	68.12	46.39	7.74	13.98
45	114.30	56.10	35.84	6.60	13.65
46	116.84	43.47	29.03	5.11	9.32
47	119.38	65.15	42.32	7.09	15.73
48	121.92	96.40	59.00	10.11	27.28
49	124.46	56.20	36.44	5.64	14.11
50	127.00	18.13	11.67	2.13	4.32
51	129.54	33.49	22.49	3.34	7.65
52	132.08	52.04	30.29	5.43	16.31
53	134.62	17.84	8.83	1.69	7.30
54	137.16	41.68	25.86	4.05	11.75
55	139.70	46.10	28.40	3.89	13.79
56	142.24	9.31	4.34	.70	4.26
57	144.78	16.79	10.80	1.51	4.48
58	147.32	--	--	--	--
59	149.86	21.20	13.69	2.47	5.02
60	152.40	--	--	--	--
61	154.94	--	--	--	--
62	157.48	12.26	8.26	1.08	2.90
63	160.02	--	--	--	--
64	162.56	13.46	8.53	1.21	3.71
65	165.10	12.31	6.47	.88	4.94
66	167.64	--	--	--	--
67	170.18	--	--	--	--
68	172.72	17.67	8.30	1.14	8.21
Total		1 997.84	1 265.56	210.83	521.43

Table 15—Cubic volumes by scaling diameter, log grade 2

(In cubic meters)

Scaling diameter		Logs	Lumber	Sawdust	Residue
Inches	Centimeters				
8	20.32	0.60	0.27	0.05	0.28
9	22.86	2.41	1.49	.26	.66
10	25.40	4.60	2.92	.47	1.21
11	27.94	6.10	3.18	.54	2.39
12	30.48	9.82	5.94	1.03	2.85
13	33.02	11.74	6.75	1.16	3.84
14	35.56	17.23	9.88	1.70	5.65
15	38.10	12.17	6.96	1.07	4.14
16	40.64	19.43	11.76	1.85	5.83
17	43.18	23.50	14.74	2.30	6.46
18	45.72	31.17	19.15	3.12	8.91
19	48.26	33.92	21.12	3.40	9.40
20	50.80	42.43	27.13	4.52	10.78
21	53.34	57.78	35.00	5.96	16.82
22	55.88	58.40	37.09	6.08	15.23
23	58.42	66.46	43.49	7.28	15.69
24	60.96	69.40	44.00	7.74	17.66
25	63.50	85.33	55.09	9.53	20.71
26	66.04	78.41	52.33	8.77	17.32
27	68.58	92.93	60.11	10.25	22.57
28	71.12	100.52	63.13	10.98	26.41
29	73.66	110.80	74.51	12.56	23.73
30	76.20	85.96	54.53	9.92	21.51
31	78.74	133.17	84.60	14.65	33.92
32	81.28	103.18	66.83	11.20	25.14
33	83.82	127.81	80.09	14.03	33.69
34	86.36	127.64	79.87	13.42	34.35
35	88.90	158.26	97.30	18.10	42.86
36	91.44	81.57	51.41	8.85	21.31
37	93.98	111.38	71.66	12.19	27.53
38	96.52	86.87	54.39	10.04	22.44
39	99.06	106.11	65.85	12.84	27.42
40	101.60	96.25	66.43	11.70	18.12
41	104.14	78.78	46.16	8.51	24.11
42	106.68	52.20	35.05	6.50	10.65
43	109.22	72.67	43.47	7.97	21.23
44	111.76	52.40	27.16	5.82	19.42
45	114.30	78.44	50.08	7.80	20.56
46	116.84	36.87	22.57	4.53	9.78
47	119.38	42.71	27.79	5.10	9.82
48	121.92	41.86	25.92	3.93	12.01
49	124.46	36.72	23.05	3.54	10.13
50	127.00	56.06	35.70	3.80	13.72
51	129.54	7.21	4.62	.63	1.96
52	132.08	5.96	3.52	.61	1.82
53	134.62	9.54	4.63	.69	4.22
54	137.16	16.02	6.37	.98	8.68
55	139.70	--	--	--	--
56	142.24	--	--	--	--
57	144.78	--	--	--	--
58	147.32	--	--	--	--
59	149.86	11.31	7.68	.99	2.63
60	152.40	--	--	--	--
61	154.94	--	--	--	--
62	157.48	--	--	--	--
63	160.02	--	--	--	--
64	162.56	15.17	9.08	1.49	4.59
Total		2 767.30	1 741.83	303.29	722.17

Table 16—Cubic volumes by scaling diameter, log grade 3

(In cubic meters)

Scaling diameter		Logs	Lumber	Sawdust	Residue
Inches	Centimeters				
6	15.24	7.51	3.22	0.62	3.67
7	17.78	6.87	3.14	.62	3.10
8	20.32	21.29	9.90	1.90	9.48
9	22.86	26.08	13.03	2.52	10.53
10	25.40	34.51	18.60	3.50	12.42
11	27.94	40.66	23.35	4.34	12.97
12	30.48	48.01	27.89	5.10	15.02
13	33.02	53.40	32.52	5.81	15.07
14	35.56	60.79	37.38	6.61	16.80
15	38.10	60.23	37.09	6.34	16.80
16	40.64	87.38	57.97	10.10	19.30
17	43.18	68.66	45.41	7.61	15.64
18	45.72	105.38	69.58	11.99	23.80
19	48.26	94.45	62.57	10.40	21.48
20	50.80	120.12	81.15	13.90	25.07
21	53.34	95.08	64.49	10.73	19.85
22	55.88	113.46	77.17	12.85	23.45
23	58.42	124.34	84.28	14.23	25.84
24	60.96	130.64	90.49	15.39	24.76
25	63.50	136.95	91.70	14.61	30.64
26	66.04	137.26	91.14	16.17	29.96
27	68.58	123.74	84.29	15.08	24.36
28	71.12	114.01	76.14	13.04	24.82
29	73.66	124.06	84.99	14.54	24.54
30	76.20	109.30	75.03	14.15	20.13
31	78.74	105.99	72.95	12.87	20.18
32	81.28	120.33	79.53	14.09	26.71
33	83.82	119.00	78.10	14.10	26.80
34	86.36	129.27	85.74	15.20	28.33
35	88.90	79.25	52.49	9.65	17.11
36	91.44	93.35	60.79	10.73	21.84
37	93.98	101.75	72.12	13.27	16.35
38	96.52	75.01	49.67	9.01	16.33
39	99.06	78.60	51.00	8.76	18.83
40	101.60	59.58	40.41	7.70	11.46
41	104.14	58.56	38.80	7.09	12.67
42	106.68	60.79	36.51	7.10	17.17
43	109.22	21.69	11.49	2.13	8.07
44	111.76	36.65	24.10	4.51	8.04
45	114.30	57.94	35.68	5.93	16.32
46	116.84	19.20	11.28	2.06	5.86
47	119.38	32.80	20.10	4.68	8.02
48	121.92	11.10	7.61	1.18	2.31
49	124.46	6.81	4.49	.91	1.42
50	127.00	13.77	7.14	1.10	5.54
51	129.54	24.10	14.24	2.77	7.08
52	132.08	--	--	--	--
53	134.62	9.70	6.29	1.43	1.97
54	137.16	--	--	--	--
55	139.70	--	--	--	--
56	142.24	26.94	14.58	2.78	9.58
57	144.78	--	--	--	--
58	147.32	10.57	5.25	.60	4.72
Total		3 396.92	2 222.89	391.81	782.22

Table 17—Cubic volumes by scaling diameter, log grade 4

(In cubic meters)

Scaling diameter		Logs	Lumber	Sawdust	Residue
Inches	Centimeters				
6	15.24	1.70	.61	.12	.98
7	17.78	.32	.20	.04	.08
8	20.32	3.82	2.03	.35	1.44
9	22.86	9.25	4.48	.81	3.96
10	25.40	8.77	3.91	.80	4.05
11	27.94	15.21	7.50	1.46	6.25
12	30.48	19.36	10.22	1.85	7.29
13	33.02	25.89	14.55	2.56	8.78
14	35.56	33.46	19.65	3.64	10.17
15	38.10	38.38	22.63	4.06	11.69
16	40.64	47.31	28.86	5.24	13.21
17	43.18	49.85	29.29	4.94	15.62
18	45.72	56.69	33.92	5.59	17.19
19	48.26	64.27	38.09	6.41	19.77
20	50.80	87.40	54.41	9.15	23.84
21	53.34	61.97	39.71	7.30	14.95
22	55.88	81.28	49.65	9.26	22.37
23	58.42	74.42	48.36	8.87	17.18
24	60.96	79.91	51.49	8.75	19.67
25	63.50	87.06	55.79	9.64	21.63
26	66.04	90.29	58.15	10.45	21.69
27	68.58	93.37	61.45	10.20	21.72
28	71.12	99.42	63.19	11.44	24.80
29	73.66	79.43	53.10	9.72	16.61
30	76.20	63.21	38.85	7.30	17.06
31	78.74	99.79	60.65	9.76	29.38
32	81.28	101.32	64.78	11.49	25.04
33	83.82	66.47	42.15	7.51	16.81
34	86.36	66.44	42.86	7.73	15.85
35	88.90	54.55	37.87	6.47	10.21
36	91.44	69.87	45.61	7.77	16.49
37	93.98	36.51	23.08	3.97	9.46
38	96.52	46.34	27.90	4.97	13.47
39	99.06	57.70	36.51	7.20	13.99
40	101.60	38.14	20.96	3.15	14.02
41	104.14	32.37	20.56	3.80	8.01
42	106.68	27.45	14.53	2.34	10.58
43	109.22	29.63	19.32	2.98	7.34
44	111.76	3.67	2.36	.56	.75
45	114.30	44.05	24.86	4.92	14.27
46	116.84	17.94	10.46	2.04	5.44
47	119.38	10.68	2.91	.58	7.19
48	121.92	--	--	--	--
49	124.46	--	--	--	--
50	127.00	6.69	3.85	.95	1.89
51	129.54	--	--	--	--
52	132.08	9.01	5.88	1.16	1.97
53	134.62	8.57	5.69	.63	2.24
54	137.16	7.48	4.13	1.00	2.35
Total		2 106.69	1 307.02	230.93	568.74

Table 18—Cubic volumes by scaling diameter for all grades

(In cubic meters)

Scaling diameter		Logs	Lumber	Sawdust	Residue
Inches	Centimeters				
6	15.24	9.21	3.83	0.74	4.65
7	17.78	7.19	3.34	.66	3.19
8	20.32	25.91	12.27	2.31	11.33
9	22.86	37.92	19.09	3.61	15.22
10	25.40	49.44	26.38	4.93	18.12
11	27.94	64.83	35.70	6.63	22.50
12	30.48	79.29	45.47	8.24	25.57
13	33.02	96.20	56.78	9.96	29.46
14	35.56	116.61	69.69	12.40	34.53
15	38.10	120.25	72.47	12.40	35.38
16	40.64	161.65	103.60	17.93	40.12
17	43.18	154.02	96.30	15.91	41.81
18	45.72	201.84	128.05	21.56	52.23
19	48.26	203.65	128.30	21.30	54.06
20	50.80	265.53	171.85	29.05	64.63
21	53.54	239.18	155.71	26.49	56.97
22	55.88	267.85	173.90	29.76	64.20
23	58.42	293.87	193.45	33.21	67.21
24	60.96	298.46	197.46	33.77	67.23
25	63.50	336.23	219.80	36.58	79.84
26	66.04	345.83	226.64	39.35	79.84
27	68.58	339.47	224.80	38.74	75.93
28	71.12	350.73	227.31	39.21	84.20
29	73.66	358.65	242.19	42.17	74.30
30	76.20	311.72	202.72	36.62	72.38
31	78.74	375.62	241.89	40.81	92.92
32	81.28	381.71	247.95	42.88	90.89
33	83.82	377.44	240.20	42.68	94.56
34	86.36	365.62	234.61	40.68	90.33
35	88.90	370.24	238.14	42.87	89.23
36	91.44	317.41	203.54	35.27	78.60
37	93.98	330.72	218.26	38.62	73.84
38	96.52	304.60	191.04	34.20	79.37
39	99.06	314.08	200.15	36.93	77.01
40	101.60	270.52	178.36	31.71	60.45
41	104.14	250.81	154.57	27.64	68.70
42	106.68	195.93	122.62	22.01	51.30
43	109.22	212.88	132.95	22.57	57.36
44	111.76	160.84	100.01	18.63	42.19
45	114.30	236.53	146.46	25.26	64.80
46	116.84	117.49	73.35	13.74	30.40
47	119.38	151.33	93.12	17.45	40.76
48	121.92	149.35	92.52	15.23	41.60
49	124.46	99.73	63.98	10.09	25.66
50	127.00	94.64	58.35	10.81	25.48
51	129.54	64.80	41.35	6.75	16.70
52	132.08	67.01	39.69	7.21	20.10
53	134.62	45.64	25.44	4.46	15.74
54	137.16	65.18	36.36	6.03	22.79
55	139.70	46.10	28.40	3.90	13.80
56	142.24	36.25	18.91	3.48	13.85
57	144.78	16.79	10.80	1.51	4.49
58	147.32	10.57	5.25	.60	4.72
59	149.86	32.50	21.37	3.47	7.66
60	152.40	--	--	--	--
61	154.94	--	--	--	--
62	157.48	12.26	8.26	1.09	2.91
63	160.02	--	--	--	--
64	162.56	28.63	17.61	2.71	8.31
65	165.10	12.31	6.47	.89	4.95
66	167.64	--	--	--	--
67	170.18	--	--	--	--
68	172.72	17.67	8.30	1.15	8.24
Total		10 268.75	6 537.31	1 136.87	2 594.58

The New Grading Rules

GENERAL SPECIFICATIONS

1. The grades are intended for 16-foot "log"[1] lengths as commonly cruised in standing trees. If the cruise log length includes trim allowance, the specifications must be applied to the entire length.

2. The grades are not intended for application to cull logs (logs with more than a two-thirds cruise volume deduction).

3. Log diameter is not a specific grading criterion. The effect of log grade and size on value and product recovery is reflected in the tables.

4. Most of the grading specifications are applied by log "faces." A log face is one-quarter of the log circumference for the full length of the log.

5. A log adjacent to a cull log must be lowered one grade even if it meets specifications for grade 1, 2, or 3.

DEFINITIONS OF GRADING CHARACTERISTICS

1. *Knots* refer to sound, live, or dead limbs or limb stubs outside of knot cluster. Diameter of knot is measured at the log surface, inside the bark but outside the limb collar or swelling that may be present.

2. *Knot indicators* are bark distortions which indicate the presence of an underlying knot. Usually there is a small hole or depression in the center of the distortion. Indicator size is determined by the vertical diameter of the depression.

3. *Knot clusters* are three or more sound limbs or stubs, 1 inch or larger, in an inseparable group. The size of individual knots in a cluster is not considered.

4. *Cluster indicators* are three or more knot indicators, usually well defined by a distorted bark pattern and surface rise.

5. *Scars* are breaks in the normal bark pattern caused by injuries from fire, logging, frost, and lightning. They may be completely overgrown with callus tissue (old injuries), partially overgrown, or open (of recent origin). Their condition, location, and size determine whether they are *degrading* and therefore considered in the log grading specifications or superficial and disregarded.

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[1] The term "log" refers to designated sections of standing trees.

(a) *Degrading scars:*
A scar is considered to be degrading when the underlying wood is decayed, excessively pitchy, severely checked, or otherwise injured to the extent that lumber or veneer recovery would be affected.

(b) *Superficial scars:*
A superficial scar is a shallow, open, and sound injury of relatively recent origin that, in the judgment of the cruisers, will not affect lumber or veneer recovery and therefore is disregarded. Small scars--6 by 6 inches or less--whether open or overgrown, are also considered to be superficial *providing they do not contain rot or are not located in the lower 8 feet of the butt log* (see scar specifications for grades 1 and 2).

6. *Conks* are the fruiting bodies of fungi and indicate presence of interior rot.

7. *Cankers* are lesions characterized by distorted bark, callus tissue, and pitch flow. Common causes are mistletoe and rusts.

8. *Rotten knots* are live or dead limbs or stubs showing rot. Rotten or "punky" knots are treated the same as conks.

9. *Sound burls* are round or elliptical woody growths that protrude abruptly from the log surface with no evidence of decay or pitch.

10. *Unsound burls* are characterized by evidence of decay or heavy pitch or both.

11. *Bumps and bulges* are bark-covered swellings on the log surface that do not conform to the normal taper or normal butt swell.

12. *Epicormic branches* are small, sprout-type limbs, that originate from dormant, usually 1/2-inch diameter or less, or adventitious buds.

13. *Holes* are the result of bird peckings or insect activity into the cambium.

APPLICATION OF GRADES

Cruisers (log graders) usually develop their own procedures for applying grading rules. Suggested steps are:

1. Size up each log with respect to knots, determining either the poorest (most shallow) or best (clearest) side.

2. Establish log grading faces based on the presence and character of any knots or indicators. Once the grading faces on a log are established, they cannot be shifted. Exception: see specifications for burls.

3. Apply knot or indicator specifications to determine preliminary grade of log; then apply other grading cirteria such as scars, conks, etc., to establish final grade. For example, if the log is knot free, it is a potential grade No. 1. The grader would then look for other possible limiting characteristics to establish the final grade.

A Summary of Specifications for the New Timber Cruising Grades for Coast Douglas-fir

Log characteristic	Grade No. 1[1]	Grade No. 2[1]	Grade No. 3[1]	Grade No. 4
Knots (sound)	One allowed if 1 inch or less, or one larger than 1 inch if within 6 inches of log end.	None allowed on two faces. Knots larger than 2 inches must be confined to upper or lower half of one face.	Knots (sound or rotten) larger than 3 inches must be confined to one face.	Any merchantable log not meeting requirements for grade No. 3.
Rotten knots	None allowed.	None allowed unless log is otherwise grade No. 1.		
Knot indicators	If larger than 1 inch, must be confined to no more than two faces.	No requirements.		
Knot clusters	None allowed.	One if confined to one face.	Any number if confined to no more than two faces.	
Knot indicator clusters	One if confined to one face.	No requirements.		
Scars	None allowed from ground line to 8 ft. Above 8 ft.: no limit for sound scars 6"x6" or smaller, larger sound scars must be confined either to one face or not more than two faces in any 1/4 of log length. No rotten scars allowed.	All scars having rot must be confined to one face.	No requirements.	
Sound burls[2]	Disregard burls if less than 6 inches in diameter.			
	If larger than 6-inch diameter, must be confined to one face.	All larger than 6 inches must be confined to three faces.		
Conks, cankers, and unsound burls	None allowed	None allowed unless log is otherwise grade No. 1.	No requirements.	
Bumps and bulges	None 6"x6" or larger allowed from ground line to 8 feet. No requirement above 8 feet.	No requirements.		
Epicormic branches and holes	Must be confined to one face.			

[1] A log meeting specifications for either grade No. 1, 2, or 3 is lowered one grade if adjacent to a cull log.

[2] When burls are considered, log faces can be shifted from the faces initially established for knots or other characteristics.

Plank, Marlin E., and John W. Henley
1976.   Lumber yields by the new timber cruising log grades for old-
        growth Coast Douglas-fir. USDA For. Serv. Res. Pap. PNW-203,
        30 p. Pacific Northwest Forest and Range Experiment Station,
        Portland, Oregon.

    Lumber grade yields and recovery ratios obtained for old-growth
Coast Douglas-fir logs are presented for the new timber cruising log
grades. Lumber yield information is based on nearly 5,000 logs proc-
essed through 10 sawmills in Washington, Oregon, and California.
Curve relationships are shown for lumber grade recovery over diam-
eter, scale recovery ratio over diameter, lumber recovery factor over
diameter, and net Scribner and gross cubic scale defect over diameter
for the four log grades. Tables provide information on lumber yield
distribution by diameter class and lumber grade in addition to the
foregoing.

KEYWORDS: Lumber recovery studies, old-growth Douglas-fir.

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1. Providing safe and efficient technology for inventory, protection, and use of resources.

2. Developing and evaluating alternative methods and levels of resource management.

3. Achieving optimum sustained resource productivity consistent with maintaining a high quality forest environment.

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